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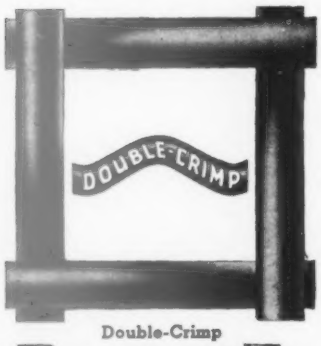
PIT AND QUARRY

SEP 30 1944

SEPTEMBER, 1944

FOR 27 YEARS THE LARGEST PRODUCER CIRCULATION IN THE FIELD

SEP 30 1944



Double-Crimp

Arch-Crimp

Intermediate-Crimp

Flat-Top

"The Perfect"

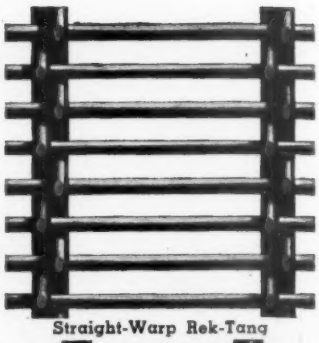
Wire Cloths and Screens

of

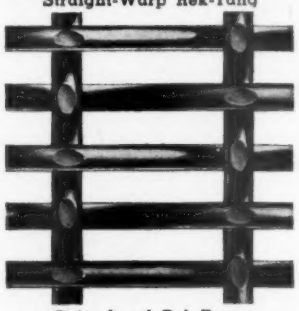
SUPER-LOY
STEEL
GALVANIZED STEEL
STAINLESS STEEL
NICKEL-CHROME STEEL
PHOSPHOR BRONZE
BRASS
COPPER
MONEL
NICKEL
ALUMINUM

•

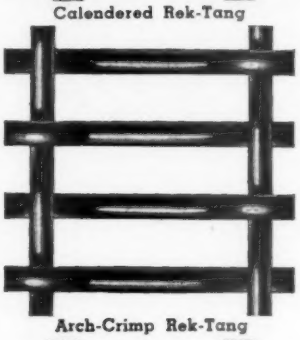
Any Special Metal for Any Service



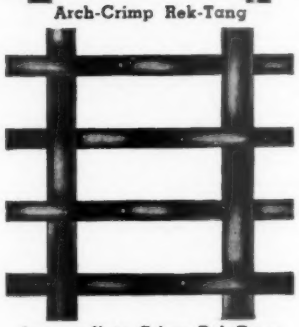
Straight-Warp Rek-Tang



Calendered Rek-Tang



Arch-Crimp Rek-Tang



Intermediate-Crimp Rek-Tang

"Perfect" WEAVES

ARCH-CRIMP
Coiled
DOUBLE-CRIMP
Double-Fill
Dutch
FLAT-TOP
INTERMEDIATE-CRIMP
REK-TANG
Selvage-Edge
STRAIGHT-WARP
Stranded
STA-TRU
Triple-Warp
Twilled
Twisted-Fill
Twisted-Warp

"Perfect" PROCESSING

Arc-Welding
Bending
Binding
Brazing
CALENDERING
Coiling
Crimping
Cutting
Dipping
Dishing
Finishing
Flanging
Flattening
Forming
Framing
Galvanizing
Jointing
Knuckling
Painting
Rolling
Selvaging
Shaping
Shearing
Slitting
Soldering
Spot-Welding
Squaring
Stitching
Tack Welding
Trimming

"Perfect" PRODUCTS

Baskets
Circles
Coils
Cones
Cylinders
Discs
Forms
Leaves
Lengths
Panels
Pieces
Ribbons
Rings
Rolls
Sections
Segments
Strips
Templates

Illustrations show items listed in capitals. Other wire cloths and screens will be illustrated in subsequent advertisements of this series.

Sta-Tru

80 000 lbs.

ON 8 FULL FLOATING WHEELS

The ceiling on payloads has been raised by Model TR-15T-EASTON's latest development. It is built for hauling heavy material loaded by large shovels in pit and quarry.

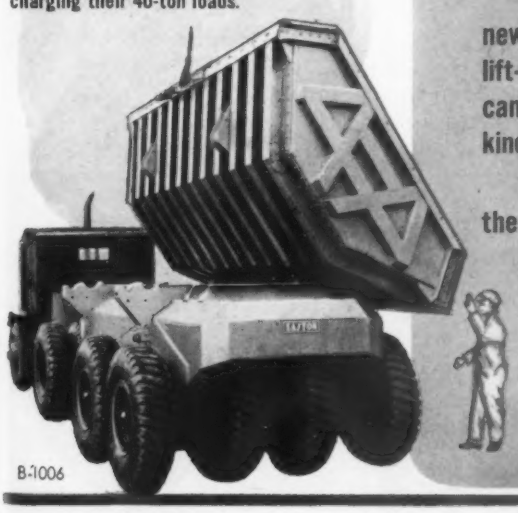
The unique wheel arrangement provides an air brake for each wheel and full-floating, spring-suspension for each dual pair. For the first time, it is now possible to build a semi-trailer of tonnage capacity limited only by the power of the tractor itself.

EASTON engineers have extended the use and application of this new full-floating wheel development to semi-trailers equipped with lift-gate or automatic down-folding door bodies. Quarries and mines can make profitable use of these large tonnage units for handling all kinds of material.

Let us have your haulage problem now! Perhaps we can give you the early delivery you want.

Write to engineering Counsel, Easton Car & Construction Company, Easton, Pa.

The TR-15T is dumped by overhead hoist. Other body models employ hydraulic hoists for discharging their 40-ton loads.



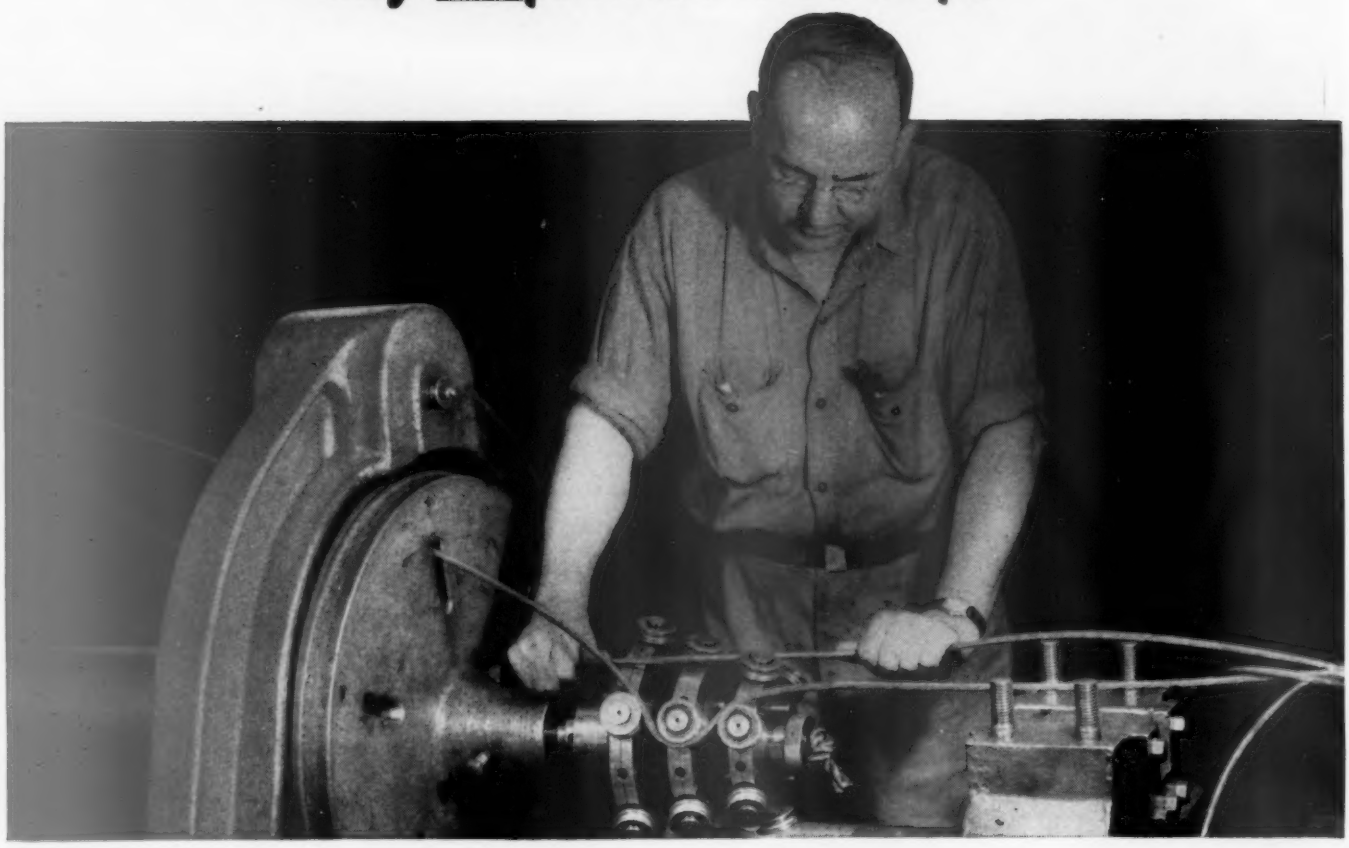
B-1006

EASTON

INDUSTRIAL CARS
TRUCK BODIES · TRAILERS
ELECTRIC LIFT TRUCKS

PIT AND QUARRY, September, 1944, Vol. 37, No. 3. Published monthly by the Complete Service Publishing Company, 538 South Clark Street, Chicago 5, Ill. Subscription price $2 for 1 year in the U. S. and possessions, Canada, Central and South America; elsewhere $1 additional for each year. Single copies 25 cents. Entered as second-class matter February 28, 1932, at the Post Office at Chicago, Ill., under the Act of March 3, 1897.

"I've been 'setting up' Preformed ever since there was any Preformed Wire Rope"



"SETTING UP" is the initial step in manufacture which determines the final quality of Preformed Wire Rope.

Each and every strand of wire must be accurately and exactly pre-shaped on the preforming head the way it is to 'lay' in the rope. In this way added strength and life are built right into the heart of the rope. A mistake here could result in "heart failure" and irreparably bad performance.

It takes hands with the "feel" for setting up to do this exacting job . . . hands like Frank Mayer's which have been making Preformed for more than twenty years—in fact, ever since the birth of Preformed.

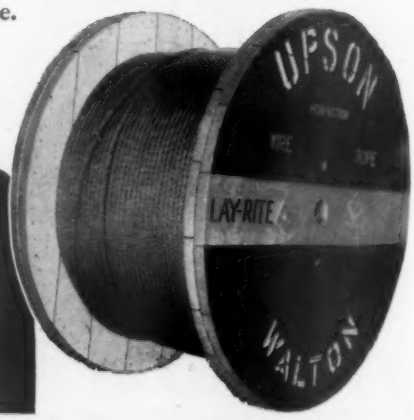
One reason you can always depend upon Upson-Walton LAYRITE Preformed Wire Rope is that every single foot of it is a *hand* controlled rope . . controlled by the most experienced hands in the business.

It always pays to specify LAYRITE Preformed made by Upson-Walton — because LAYRITE is "set up" with consummate skill born of experience, for which there is never any satisfactory substitute.

U-W

Established 1871

Upson-Walton also manufactures wire rope clips, thimbles and sockets; tackle blocks, snatch blocks, turnbuckles and shackles



THE UPSON-WALTON COMPANY

Manufacturers of Wire Rope, Wire Rope Fittings, Tackle Blocks

NEW YORK • PITTSBURGH • CLEVELAND • BUFFALO • CHICAGO

Job-Tested Proof that Lorains Are Money-Makers in Rock . . .

A 3,000,000 ton payload of crushed rock in a single year. That's the story of Lorain performance and production on this quarrying operation* where each of five 2 yd. Lorain 82's averaged over 50,000 tons of rock a month for twelve consecutive months.

A steady rock diet like this means plenty of power—and *Lorains are long on power* which is applied through: (1) The Center Drive design which permits ganging-up full engine power on any one operation; (2) the Hydraulic Clutch that cushions impacts and shocks, absorbs stresses and strains, prevents engine stall and protects cable life.

Keep the 2 yd. Lorain 82 (with hydraulic clutch) in mind for those jobs where *big production means bigger profits.* For complete details get in touch with your Lorain distributor, now!

THE THEW SHOVEL COMPANY • Lorain, Ohio

*Location on request

Reg. Trade Mark

thew-Lorain

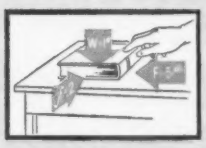
CRANES • SHOVELS • DRAGLINES • MOTO-CRANES

Back of every Velvetouch·Installation . . .

Behind each Velvetouch clutch facing and brake lining are years of leadership in developing powdered metal friction materials . . . plus the facilities of a well equipped laboratory devoted exclusively to the study of pairs of *rubbing surfaces.* Modern science and engineering skill can produce no finer friction materials than Velvetouch for brake and clutch replacements in tractors, power shovels and other earth-moving equipment.

THE S. K. WELLMAN COMPANY
1374 EAST 51st STREET • CLEVELAND 3, OHIO

Interesting facts about *Friction*



The coefficient of friction (f) of a book sliding across a table top is easily determined by dividing the weight of the book (W) by the amount of force required to slide the book (F).

Because many factors affect the coefficient of friction, i.e. speed, pressure, temperature, etc., it is impossible for any material to have a uniform coefficient of friction under all operating conditions.

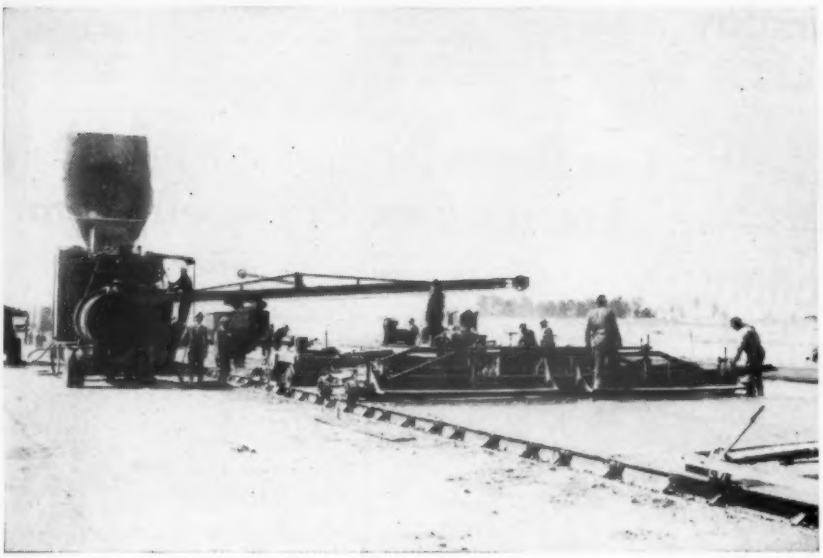
The powdered metals in Velvetouch are combined in a wide variety of "mixes" to give the best possible coefficients of friction for each installation.

For Brake and Clutch . . . Use Velvetouch

Velvetouch is *all metal* — a combination of powdered metals, compressed, sintered and welded to a solid steel backing.

Gulf Quality Lubricants and Fuels

help paving contractor make fast time on big airport job!



Wm. F. Bowe & Company, Augusta, Ga., is ahead of schedule in paving this airport runway extension in Georgia. The job involves laying 160,000 square yards of concrete. In the photograph at the right, a Gulf Service Engineer is shown consulting with Superintendent Charles Davant on the lubrication of paving equipment.

With Gulf Products contractor steers clear of mechanical delays to maintain a rush schedule of 5,000 square yards per day——————

5,000 square yards of concrete a day is the fast schedule maintained by Wm. F. Bowe & Company on this important airport project. Superintendent Charles Davant, veteran of many rush jobs, says, "We help keep our equipment in top-notch condition and avoid mechanical delays under this hard-driving schedule with Gulf quality lubricants and fuels."

There's no allowance in most wartime contracts for breakdowns and delays due to mechanical troubles. That's why a majority of leading contractors on all types of projects keep a Gulf Service Engineer "in the picture" and adopt his recommendations for lubricating and fueling every unit of equipment.

Gulf Service Engineers give valuable assistance on hundreds of jobs by applying lubrication know-how based on years of training and practical on-the-job experience. They help keep contractors' equipment in continuous operation under all kinds of conditions—and maintenance costs at rock-bottom levels.

Call in a Gulf Service Engineer before you start your next job—he will help you complete it more quickly and at a larger profit. Write, wire, or phone your nearest Gulf office today.

BACK THE INVASION . . . BUY MORE WAR BONDS!

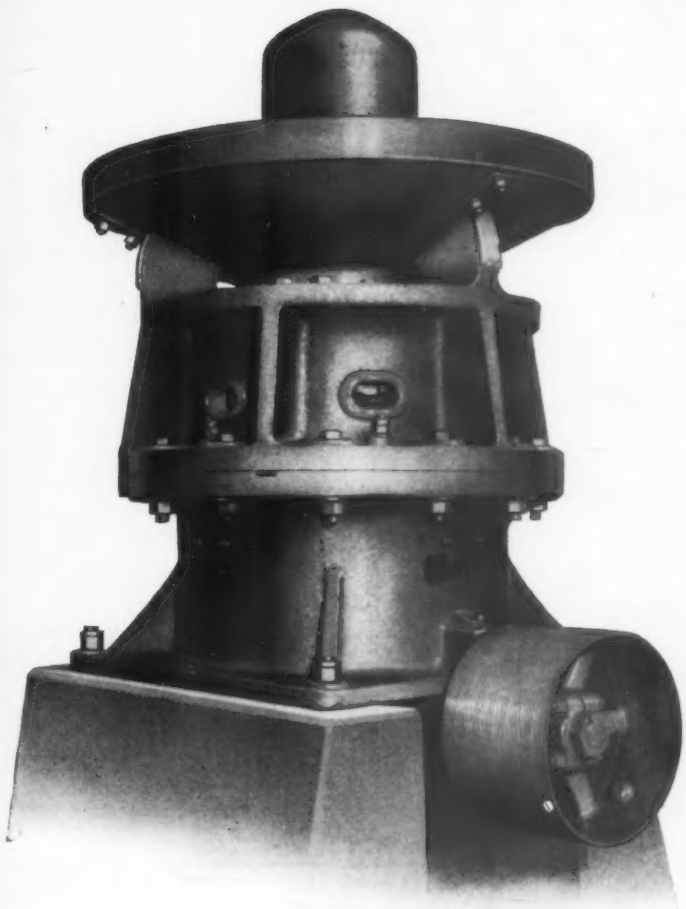
GULF

GULF OIL CORPORATION · GULF REFINING COMPANY

GULF BUILDING, PITTSBURGH 30, PA.

East Pepperell Plant to Get Army-Navy "E" Award
Bemis Bro. Bag Co. Presentation to Follow Parade and Elaborate Cere
Pepperell Plant Wins High Praise
Army-Navy to Take Part in Bemis "E" Ceremonies
Bemis Bag Co., Pepperell, Gets E Award on Thursday
Gas Resistant Sacks Win 'E' For an East Pepperell Firm
War Activities of New England
East Pepperell Plant Honored With Army-Navy "E" Award
Bemis Bro. Bag Co., Wins Tribute From
Grateful...
Proud...
Humble...
Bemis Bro. Firm to Get Army "E" for Fine Service
EMPLOYEES of the Bemis Bro. Bag Co. at East Pepperell, Mass., whose war production work has earned the prized Army-Navy "E" are deeply grateful for the opportunity to help their country and the men fighting for it.
They are proud that their work has been considered worthy of this special recognition by our Army and Navy.
They are sincerely humble in the realization that their contribution is, even so, only "a drop in the bucket" compared to that of the fighting men whose efforts they are supporting.
And the Bemis Company is proud of these employees . . . and grateful and humble with them.
BEMIS BAGS
BEMIS BRO. BAG CO.
Peoria, Ill. • East Pepperell, Mass. • Mobile, Ala.
San Francisco, Calif. • Wilmington, Calif. • St. Helens, Ore.
BETTER BAGS SINCE 1858

Multi-Stage FINE REDUCTION CRUSHER



SPECIFICATIONS

Upper Shell—Cast Steel, with the Spider integral.

Bottom Shell—Cast Steel, with all-around discharge.

Main Shaft—Forged Steel, short design.

Head Mantle and Concaves—Manganese Steel Bell Heads and Curved Concaves. Upper Stage and Lower Stage independently adjustable.

Shaft Suspension—quick release.

Gearing—Cast Steel, cut teeth.

Countershaft—Roller bearing.

Lubrication—Automatic.

Dust Protection—Positive.

Sizes: Four, ranging from 14 T.P.H. to 1/8" to 119 T.P.H. to 3/4".

The Multi-Stage is really *three* machines in one frame—the feed to the Upper Stage is a secondary crusher product and it does about fifty percent of the required fine crushing. It delivers to the Lower Stage a sized feed distributed all around the crushing chamber of the latter, in just the right quantity, thus enabling the finishing to be done at highest efficiency. As a result the power cost runs as low as 6/10 H.P.T. and an average of 1-2/10 H.P.T. for all sizes.

WE BUILD

Rotary Kilns
Rotary Coolers
Rotary Dryers
Rotary Slakers
Scrubbers
Evaporators
Jaw Crushers
Gyratory Crushers
Reduction Crushers
Crushing Rolls
Grinding Mills
Ball Mills
Rod Mills
Tube Mills
Pug Mills
Wash Mills
Feeders
Rotary Screens
Elevators

GET BULLETIN 1113

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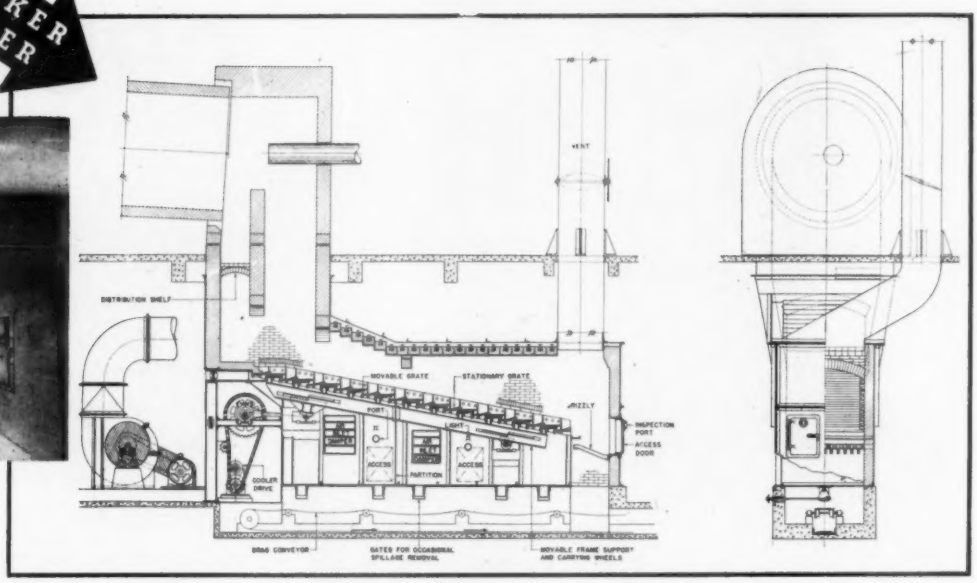
Export Department — 104 Pearl St., New York City. Foreign Sales Agencies: London, Lima, Rio de Janeiro, Buenos Aires, Santiago, Antofagasta, Oruro, Montevideo, La Paz

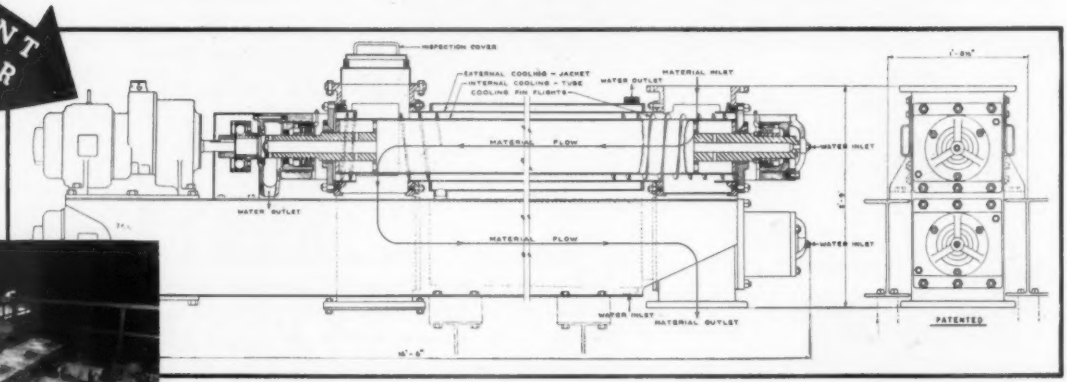
Fuller Coolers

IMPORTANT EQUIPMENT TO BE GIVEN CAREFUL CONSIDERATION BY EVERY FAR-SEEING CEMENT-MILL OPERATOR . . . NOW!

CLINKER COOLER



CEMENT COOLER



Our Engineering Department is at your service. Write us today. We'll be glad to assist you in every way possible.

FULLER COMPANY, CATASAUQUA, PA.

Chicago 3 · 1144 Marquette Bldg.
San Francisco 4 · 421 Chancery Bldg.
Washington 5, D.C. · 618 Colorado Bldg.

CO-14

FULLER COMPANY

FULLER-KINYON, FULLER-FLUXO AND THE AIRVEYOR CONVEYING SYSTEMS . . . ROTARY FEEDERS AND DISCHARGE GATES . . . ROTARY AIR COMPRESSORS AND VACUUM PUMPS . . . AIR-QUENCHING INCLINED-GRATE COOLERS . . . DRY PULVERIZED-MATERIAL COOLER . . . AERATION UNITS . . . MATERIAL-LEVEL INDICATORS . . . MOTION SAFETY SWITCH . . . SLURRY VALVES . . . SAMPLERS

IT HAS NO EQUAL
for mine and
quarry hauling
GOODYEAR
HARD ROCK
THERE'S A GOODYEAR FOR EVERY JOB
For mud and marsh specify Goodyear Sure-Grip
For drawn dirt movers—specify Goodyear All-Weather Earth-Mover

Euclid Wagon equipped with
GOODYEAR HARD ROCK LUGS,
used in Minnesota strip mine

YEARS of experience prove this husky Goodyear Hard Rock Lug tire is in a class by itself for all heavy hauling where tires are exposed to cutting, snagging and bruising.

That's because it is specially designed for rock work. It is armored with massive, wide-based lugs that provide sure-footed, non-slip traction — and extend deep down over the sidewalls to protect all parts of the tire from cuts.

It's a universal, two-way tread—no rights and lefts —with the same powerful grip in reverse as forward. It's a self-cleaning tread, with straight, wide, V-shaped grooves open at the ends — so pitched that dirt and stones are forced out as the tire revolves. It won't trap and hold stones!

Add to this the rugged strength of its low stretch Supertwist cord carcass, its heavy beads that insure firm seating and you get a tire that laughs at the tough jobs. You don't have to take our word for that. The fact that Goodyear Hard Rock Lugs are first choice where the going is toughest proves it.

BUY WAR BONDS — BUY FOR KEEPS

Supertwist, Sure-Grip, All-Weather—T. M.'s The Goodyear Tire & Rubber Company

GOODYEAR

THE GREATEST NAME IN RUBBER

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

Special Features of the LOW SIDE ROLLER MILL

Pneumatic Feed Control to maintain maximum "load" on mill.

Self-lubricating oil journals.

Improved fan arrangement to reduce abrasive wear.

Spider vanes in separator for better classification.

Air-drying system optional to remove moisture while grinding.

Over the half-century that Raymond equipment has been identified with the mineral fertilizer industry, these vital years have demanded the utmost in production standards.

Vast increases in farm acreage resulted in a rise in consumption of liming materials alone from 1½ million to nearly 25 million tons annually during the past decade.

To producers of agricultural limestone and phosphate rock fertilizer, Raymond LOW SIDE ROLLER MILLS offer the advantages of high output per horsepower with record low operating and maintenance costs.

Their dependability has been proved by years of steady performance in the leading plants of the industry.

Write for Roller Mill Catalog No. 34

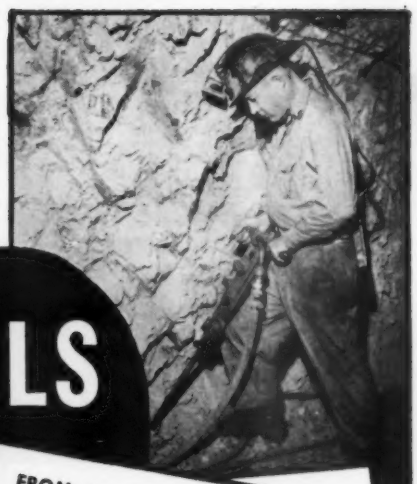
RAYMOND
PULVERIZER DIVISION

COMBUSTION ENGINEERING COMPANY, INC.

Sales Offices in Principal Cities
Canada: Combustion Engineering Corp. Ltd., Montreal

1321 North Branch Street, CHICAGO 22, ILL.

We Quote - PIT OPERATORS EVERYWHERE...



Thor ROCK DRILLS

"OUT-DRILL EVERYTHING ON THE JOB"

FROM A MAMMOTH PENNSYLVANIA CRUSHED STONE PRODUCER*

"Thor Rock Drill was put through rugged stripping tests and out-drilled everything on the job, showing exceptionally powerful hole-blowing capacity by holding to steady drilling despite hitting three inches of clay every three or four feet."

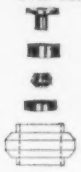
FROM AN ARIZONA DEVELOPMENT*

"Thor Rock Drill used in five different veins of varied texture and hardness showed such excellent results that runners took it apart to admire fine construction."

FROM A COLORADO OPERATOR*

"Thor Rock Drill drilled as deep as 25 feet in clay streaked conglomerate rock with amazing hole-cleaning power...out-drilled every other tool on every operation."

OPERATORS ARE *SOLD* ON THESE THOR PERFORMANCE AND MAINTENANCE FEATURES

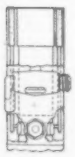


● LOW AIR CONSUMPTION

Thor Positive Short-Travel Tubular Valve uses effectively every ounce of air that enters the machine . . . measures air to a tolerance of .00025 of an inch!

● STEADY, FAST DRILLING

Extra-powerful rotation through extra sturdy rifle bar assembly and positive, non-slip ratchet action prevents stalling, even in heavy, sticky formations . . . full air power behind the piston gives the steel maximum forward and rotating power.

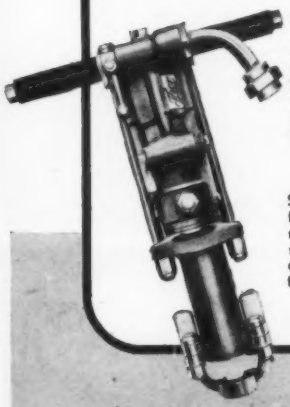


● AUTOMATIC LUBRICATION

On each reciprocation of the Thor piston hammer, oil is forced under pressure through a felt filter pad to keep every part of the machine constantly lubricated.

● OPERATING EASE

The Thor four-position throttle gives the operator complete control of drilling speeds for all operating conditions. Exclusive Thor spring retainer design provides quick, easy removal of the steel—provides longer life with fully enclosed springs that cannot clog or be over-tightened.



● POWERFUL HOLE-BLOWING

Thor air economy in turning every foot of air into power combines with powerful rotation to provide steady, maximum hole-cleaning ability.

Send today for complete information about Thor's wide range of light and heavy duty sinker, drifter and stoper rock drills and associated quarry tools in Catalog 42-A.

Straight from the pits come these reports of Thor Rock Drills *out-drilling everything on the job* in all types of formations.

On-the-job tests like these are making Thor Rock Drills the popular choice of top-producing pit operators everywhere who *know* Thor performance . . . who *know* the low maintenance, smoother, faster handling made possible by Thor design and construction.

*Name furnished on request.

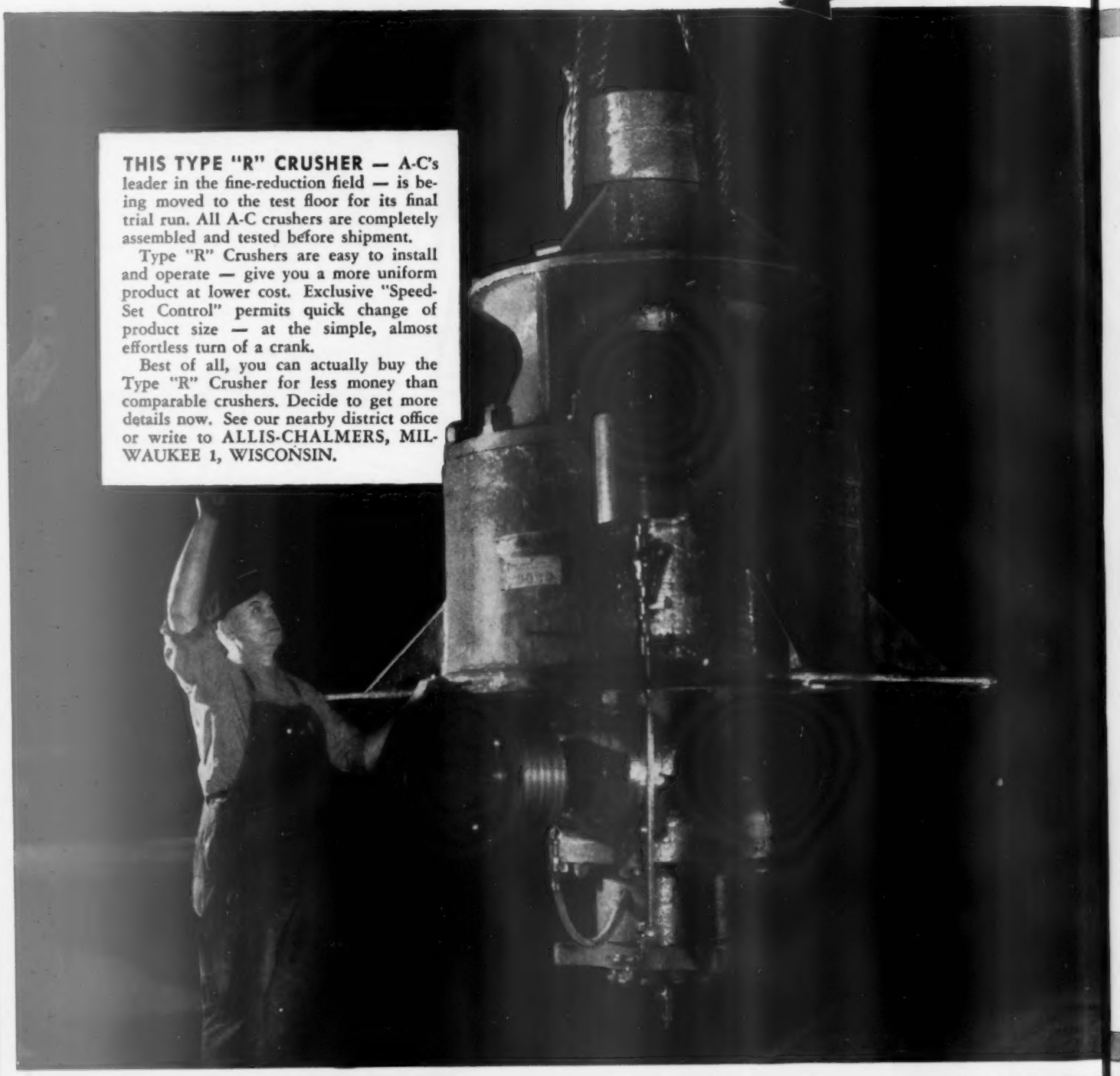
Thor Portable Pneumatic and Electric Tools

INDEPENDENT PNEUMATIC TOOL COMPANY

600 W. JACKSON BOULEVARD, CHICAGO 6, ILL.

Branches in Principal Cities

You Buy This...



THIS TYPE "R" CRUSHER — A-C's leader in the fine-reduction field — is being moved to the test floor for its final trial run. All A-C crushers are completely assembled and tested before shipment.

Type "R" Crushers are easy to install and operate — give you a more uniform product at lower cost. Exclusive "Speed-Set Control" permits quick change of product size — at the simple, almost effortless turn of a crank.

Best of all, you can actually buy the Type "R" Crusher for less money than comparable crushers. Decide to get more details now. See our nearby district office or write to ALLIS-CHALMERS, MILWAUKEE 1, WISCONSIN.

WE WORK FOR VICTORY — WE PLAN FOR PEACE

ALLIS-

BASIC EQUIPMENT FOR CRUSHING & MINING INDUSTRIES:

Jaw, Gyratory, Hammer & Roll Crushers, Ball & Rod Mills

Kilns, Coolers, Roasters, Dryers

...You Get This!

1 PRODUCTION ANALYSIS

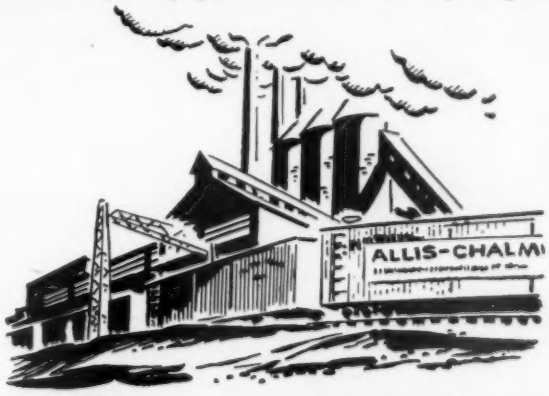
There's no guesswork when you specify Allis-Chalmers Cooperative Engineering. A-C engineers, working with your own staff, analyze your production process — find ways to make *existing* as well as *new* equipment "team up" for greater production.

2 LABORATORY ANALYSIS

Trained engineers in A-C's modern chemical and processing laboratories help solve problems as they arise . . . thoroughly analyze and test samples of your particular product. This is another precaution that the *right* equipment is selected for your plant.

3 UNBIASED RECOMMENDATION

Allis-Chalmers builds *all* types of basic processing machinery; its engineers don't have to "push" *one* type of equipment. Result: their recommendation is unbiased . . . because it is dictated by *exactly what you need,* not an improvised arrangement!



4 EMERGENCY PARTS SERVICE

There's no "sell-and-forget" attitude at A-C. With district offices conveniently located in your area, you are assured of *emergency expediting* when replacements or repairs are needed. In most cases, parts are shipped immediately from stock.

CHALMERS

Vibrating & Revolving Screens, Feeders, Conveyors, Hoists

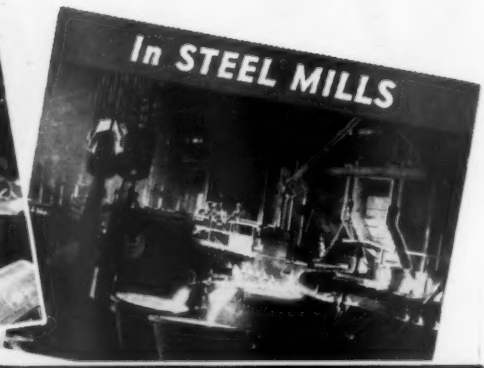
Washers, Scrubbers, Blade Mills, Centrifugal Pumps

Tractors, Gasoline Power Units, etc.

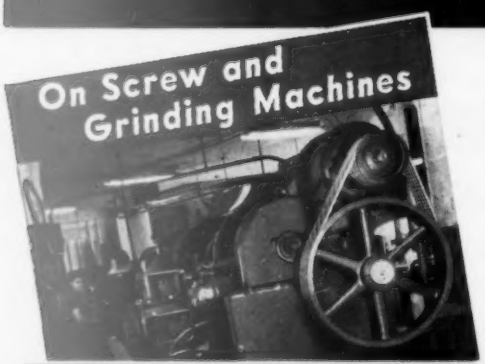
Motors, Texrope Drives, Power Equipment

A 1722 A

For MORE *than* 6 YEARS . . .



GATES *Synthetic Rubber* V-Belts



449

—Have Been *OUTWEARING* Any *NATURAL RUBBER* Belts Ever Used!

More than 6 years ago Gates began supplying American Industry with thousands upon thousands of V-Belts made *entirely* of synthetic rubber.

This was long before synthetic rubber came to be used merely as a *substitute* for natural rubber—in fact, Gates chose a very *special* synthetic rubber for the one reason that it is, in many important respects, *greatly superior* to natural rubber.

***There are, of course, many kinds of synthetic rubber. Gates uses each kind where it best meets some particular service need.**

For example:—one special synthetic rubber which Gates uses extensively in making V-Belts has the ability to withstand oil and heat much better than natural rubber can. Where oil and heat conditions are especially severe, Gates special synthetic V-Belts are giving 3 times to 4 times the service life of any natural rubber V-Belts ever used.

This is the record not of a few belts over a limited period but of thousands upon thousands of Gates synthetic rubber V-Belts installed in hundreds of plants and factories during the past 6 years.

Today, as you know, all industry depends on belts made of synthetic rubber—and that is exactly why Gates' long head-start in fabricating belts of synthetic rubber is so *important* to you *NOW!*

By simply picking up your phone and calling the Gates Rubber Engineer, you can now have, in your own plant, the full benefits of Gates' greater knowledge and experience—a distinct advantage to you in *longer belt life* and in *trouble-free operation.*

THE GATES RUBBER COMPANY

Engineering Offices and Stocks in All Large Industrial Centers

GATES VULCO ROPE DRIVES

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ATLANTA, GA. 738 C & S National Bank Building
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DALLAS, TEXAS 2213 Griffin Street
SAN FRANCISCO, CAL. 1090 Bryant Street

TO MAKE SURE YOU'RE OPERATING YOUR CARRYALL SCRAPERS AT TOP EFFICIENCY

Check Your Operations

WITH THIS HANDY LeTOURNEAU CHECK-LIST*

It's planned to cover your complete earthmoving cycle, shows you what to look for at every operating step

If you're not getting the yardage from your tractor-scraper rigs that you think you should, use this simple LeTourneau Carryall Check-List. It will quickly show you where the job is falling down and what to do to correct the situation.

MORE OPERATING IDEAS

The LeTourneau Co-Operator, a factual 16-page magazine, is written by men who know earthmoving methods and equipment maintenance from years of actual experience. It will show your operators how to get more work from your present equipment through efficient job-proved methods; tells how to make your LeTourneau equipment last longer, through a series of articles on equipment repair, service, lubrication, cable care, tires, etc. Free to you and your men. Write for your copies TODAY. Just address: R. G. LeTourneau, Inc., Dept. PQ-944, Peoria, Illinois.

This operator loads his LeTourneau model LS Carryall to 11 yards heaped capacity each trip. After stripping overburden, a LeTourneau Rooter is used to break up limestone, thus speeds excavation and assures bigger loads faster. The job: Dixie Lime Rock Company pit, near Ocala, Florida.

LOADING . . . Check These Points ✓

1. Carryall Scrapers should carry heaping loads.
2. Loads should be obtained in 100 feet or less.
3. In average conditions, heaping loads should be obtained in 1 minute or less (for Carryalls over 15 heaped yards pusher or snatch generally required).
4. If more than 100 feet or 1 minute is required to load, then . . .
5. Material may be too hard and should be broken with a Rooter, or . . .
6. Blade may be cutting too deep, causing tractor motor to slow down, or . . .
7. Cut may be too light, not making full use of tractor power.
8. ***Always*** establish down-hill loading. It's rarely ever impossible.

HAULING . . . Check These Points ✓

1. Tractor should average 4.0 m.p.h. travel speed in normal conditions.
2. Use highest gear utilizing full r.p.m.
3. No more than ¼ minute is necessary for each turn.
4. Use shortest travel routes.
5. Maintain smooth roadways for traveling in highest possible gear.

SPREADING . . . Check These Points ✓

1. Spread loads in highest possible gear.
2. Unload dirt in the shortest distance possible, according to depth of spread.
3. Spreading should be accomplished in .5 of a minute or less.
4. Get off the waste area as soon as possible.

MECHANICAL—(Check with LeTourneau Maintenance Manuals)

1. Check all adjustments on Carryall Scraper and Power Control Unit.
2. Carryall blade should be installed properly to keep it sharp.
3. Cable must run free on sheave wheels without binding.
4. Lubricate sheave bearings every 8 hours. (See LeTourneau Lubrication Chart)
5. Check all moving parts for free movement.
6. Check tire pressures for job conditions. (See LeTourneau Tire Chart)

CHECK WITH YOUR DEALER—If your check-up shows a need for repairs or parts, call your LeTourneau Distributor—he's completely equipped to handle your repair job quickly, thus reduce costly downtime. Check with him NOW.

*Prepared by the LeTourneau Field Engineering Dept. from field observation of several million yards of earthmoving at home or abroad. If you have special earthmoving problems, please feel free to call on this Department.

LETOURNEAU

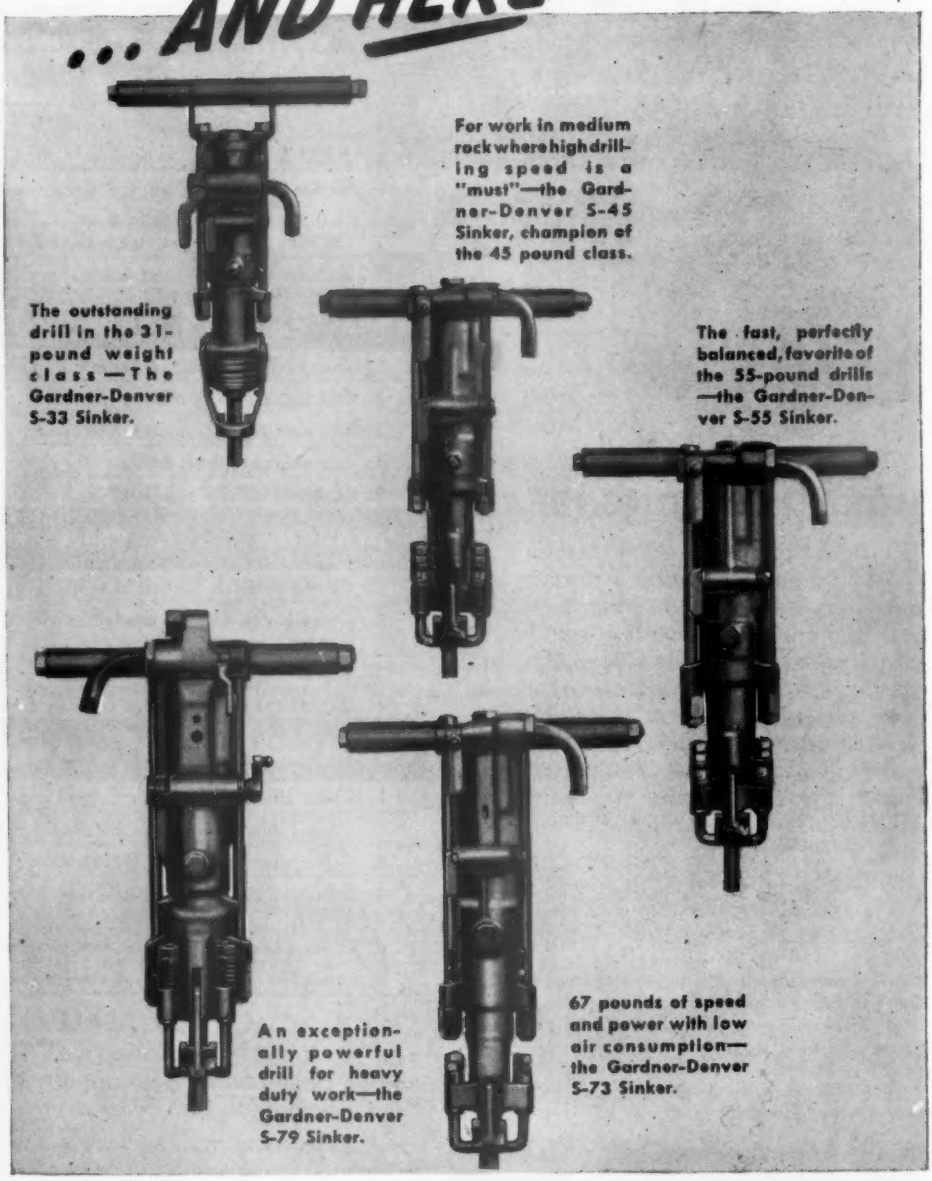
PEORIA, ILLINOIS . STOCKTON, CALIFORNIA

Manufacturers of TOURNAPULLS*, DOZERS, CARRYALL* SCRAPERS, POWER CONTROL UNITS, ROOTERS*, SHEEP'S FOOT ROLLERS, TOURNAROPE*, TOURNATRAILERS*, TOURNAWELD*, TOURNACRANES*.

*Trade Mark Reg. U. S. Pat. Off.

BALANCE COUNTS HERE

... AND HERE


The outstanding drill in the 31-pound weight class—The Gardner-Denver S-33 Sinker.
For work in medium rock where high drilling speed is a "must"—the Gardner-Denver S-45 Sinker, champion of the 45 pound class.
The fast, perfectly balanced, favorite of the 55-pound drills—the Gardner-Denver S-55 Sinker.
An exceptionally powerful drill for heavy duty work—the Gardner-Denver S-79 Sinker.
67 pounds of speed and power with low air consumption—the Gardner-Denver S-73 Sinker.

Perfect Balance

. . . that's what makes Gardner-Denver Sinking Drills so popular with contractors and operators alike.

For that perfect balance means smooth, easy riding. And easy riding means less fatigue . . . allows the men to put in more footage per shift—every shift.

Gardner-Denver Sinkers are noted for their hole-cleaning ability—their drilling speed and powerful four-pawl rotation. For that extra performance you want in a sinking drill . . . for speed, dependability and low-cost operation, check the Gardner-Denver line. There's a champion in every weight class.

For complete information and specifications, write Gardner-Denver Company, Quincy, Ill.

Since 1859 **GARDNER-DENVER**

3 engine enemies you can defeat...

Wear, rust, and sticking...

all adding up to increased destruction of your engine cylinders.

You can defeat these enemies by having PORUS-KROME applied to your cylinder walls. It multiplies cylinder life 4 to 20 times, ring life 3 to 5 times, and reduces the risk of scoring or scuffing.

PORUS-KROME is hard chromium, applied to cylinder walls by the patented process discovered by Hendrik van der Horst. It has tiny pockets in the surface which hold lubricating oil and feed it back as needed. And chrome's resistance to corrosion is well known.

While the process is new to most U. S. civilian engines, thousands upon thousands of engines have been treated with PORUS-KROME for use in the armies and navies of the United Nations. Here, where severe usage and constant operation make reliability all important, PORUS-KROME has proved its value.

You, too, can have this greater engine reliability. *Plan now* to specify PORUS-KROME in every engine you buy.

VAN DER HORST

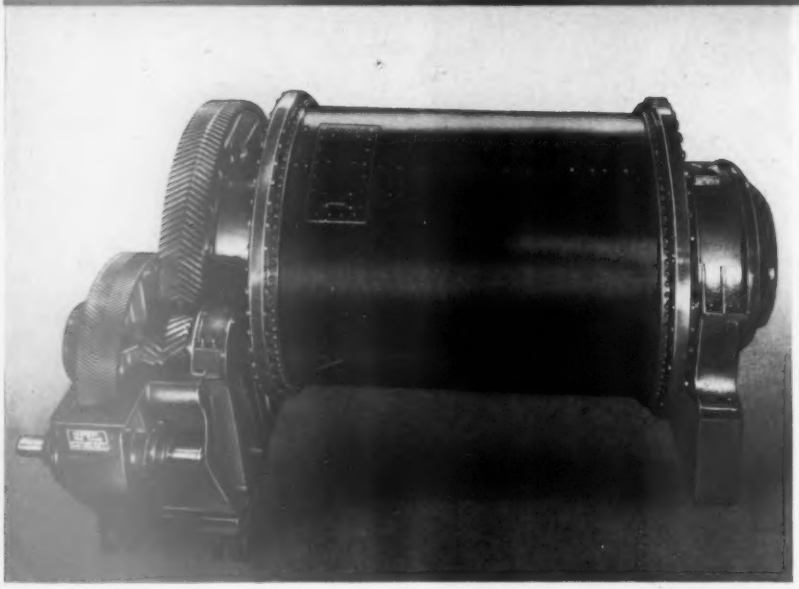
PORUS - KROME

Good for the Life of your Engines

VAN DER HORST CORPORATION OF AMERICA • OLEAN, NEW YORK • CLEVELAND 11, OHIO

AN AFFILIATE OF DRESSER INDUSTRIES

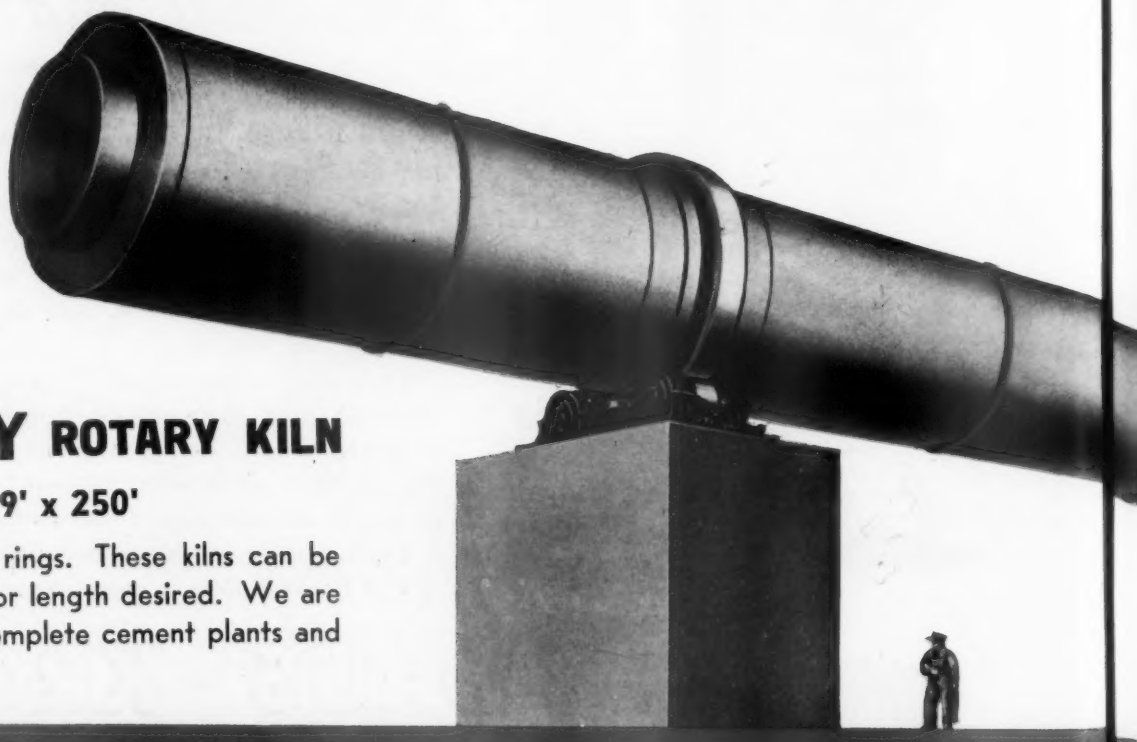
KENNEDY *gives you*



WE MANUFACTURE MACHINERY FOR A COMPLETE CEMENT PLANT . . .

KENNEDY INTEGRAL GEAR DRIVEN TUBE MILL

The new KENNEDY Integral Gear Drive for Tube Mills can be used on Combination Ball Mills, Wet Grinding Tube Mills, Dry Grinding Tube Mills and Air Swept Tube Mills. It is impossible to mis-align these gears because the gear housing supports both the discharge end of the mill and the roller bearings carrying the gears. All bearing seats are machined in a jig at the factory to a tolerance of 3/1000 of an inch.



KENNEDY ROTARY KILN

10' x 9' x 250'

Mounted on 4 riding rings. These kilns can be built in any diameter or length desired. We are prepared to furnish complete cement plants and mining plants.

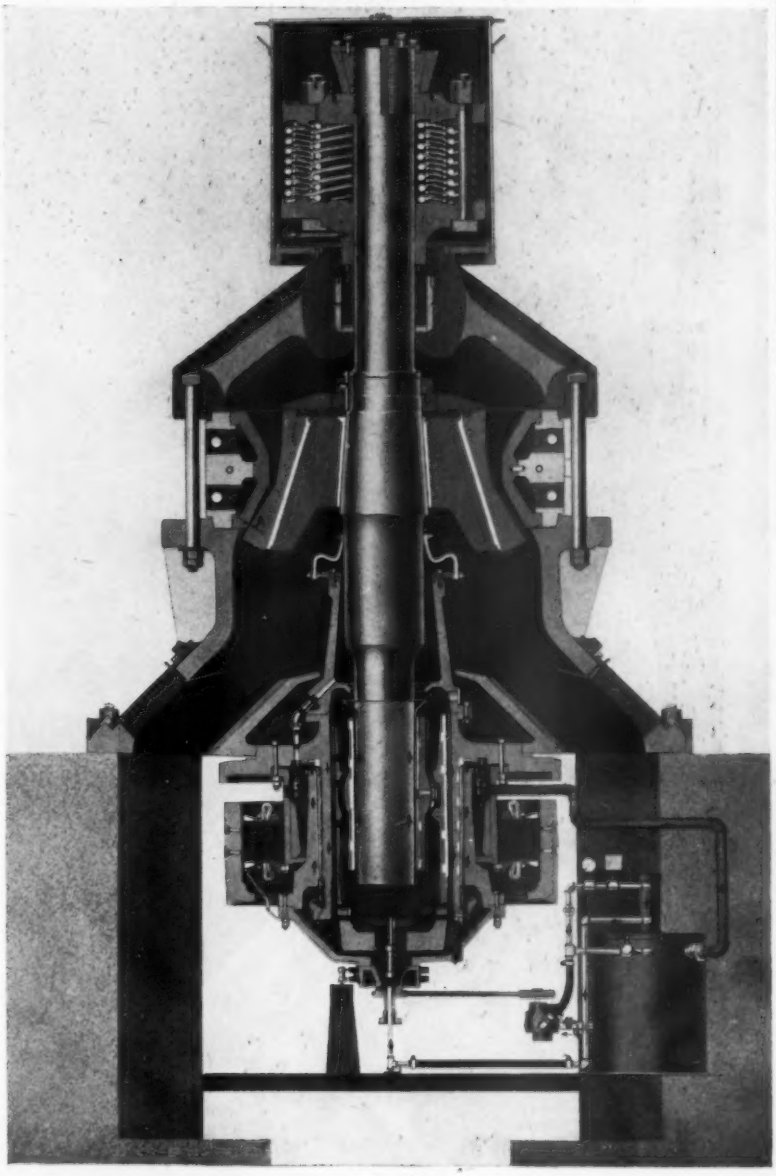
KENNEDY-VAN SAUN MFG. & ENG. CORPORATION

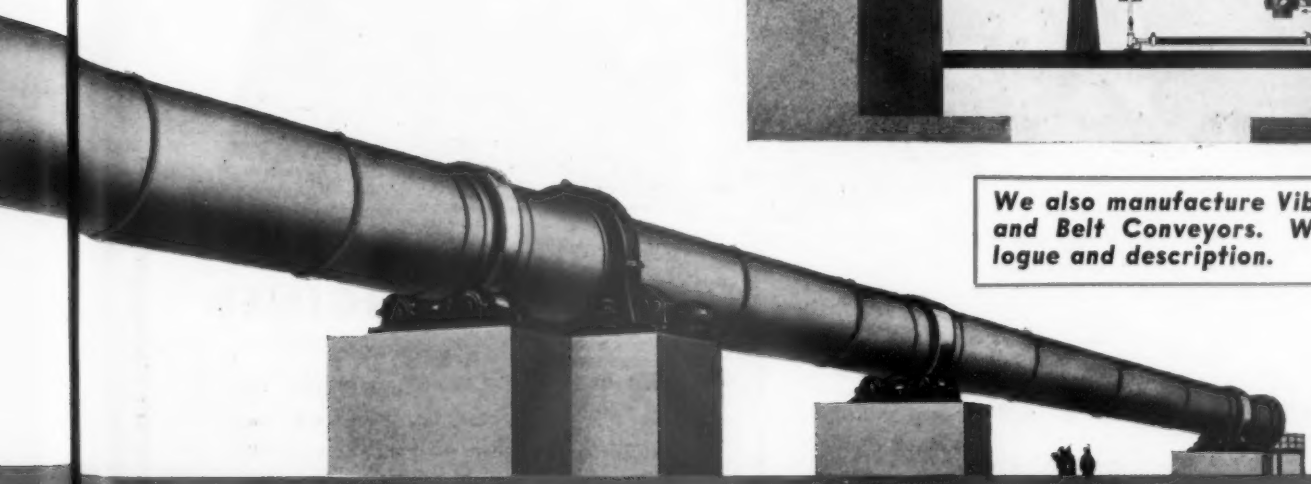
Efficient, Reliable Performance!

A #49½
KENNEDY
BALL BEARING GEARLESS CRUSHER

with a Synchronous Motor built in its pulley. This machine shows **80% saving in the cost of maintenance** and a saving of **50% in power** over geared crushers. It has produced 156 tons per hour when set to 7/16" between the head and concaves at the bottom.

Write for information on KENNEDY Ball Bearing Gearless Standard and Secondary Crushers, Jaw Crushers, etc.





We also manufacture Vibrating Screens and Belt Conveyors. Write for catalogue and description.

2 PARK AVENUE • NEW YORK 16, N. Y. FACTORY: DANVILLE, PA.

"WE'RE SHOWING A REAL POWER PROFIT SINCE WE INSTALLED THE SUPERIOR DIESEL"

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Division of The National Supply Co.

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Sales Offices: Springfield, Ohio; Boston; New York; Philadelphia; Washington, D. C.; Jacksonville; Houston; Fort Worth; Tulsa; Los Angeles; Chicago.

Factory: Springfield, Ohio.

Superior DIESELS • STATIONARY, 31 to 1200 H. P.

MARINE, 28 to 1200 H. P. • GENERATOR SETS, 12½ to 770 kw.

SNAPSHOT of an explosion

HERE IS A STORY OF AN EXPLOSION—as told by the explosive itself. The narrow, white streak at the right is the path of detonation, flashing through the explosive at about 250 miles a minute! The feathery haze is a photographic record of white-hot gases bursting outward at tremendous pressures as high as a million pounds to the square inch.

Facts such as these are recorded, studied, and analyzed by Hercules scientists. Each day scores of research projects are carried on to broaden the knowledge and understanding of explosives. It is through constant, intelligent research that we endeavor to help you and thus benefit ourselves.

HERCULES EXPLOSIVES

HERCULES POWDER COMPANY
INCORPORATED
960 King Street
Wilmington 99 . . . . . Delaware

There isn't a soft spot in a quarry, and any piece of equipment that can't take a beating had better stay at home.

That goes for wire rope, too—and it's one of the reasons why Bethlehem Purple Strand gets the roughneck assignments. You'll find Purple Strand rope on the boom and hoist lines of power shovels; you'll find it on dragline equipment, and in the holding and closing lines of grab buckets . . . tough, wearing jobs, every one of them.

In this kind of work, where the rope is often required to pass around small sheaves, Purple Strand Form-Set (preformed) is frequently specified over the non-preformed type. Form-Set is preferable, too, in derrick and crane service where the motion of the suspended load tends to twist the lines, for its "life expectancy" is considerably greater than that of ordinary rope.

The tougher the job, the more you need Purple Strand—either Form-Set or non-preformed, as circumstances require. Why not ask a Bethlehem man to explain its solid advantages?

When you think WIRE ROPE

. . . think BETHLEHEM

AMERICA IS *Built with Aggregate!*

Cedarapids

Built by IOWA

THIS is the home of national champions. They earned their title because of superior performance, teamwork, and the will to win.

Building a strong, safe, and permanent stadium like this requires similar qualities. The cooperation and spirit are American free enterprise which developed the equipment for producing huge quantities of low cost aggregates able to meet strict specifications. Such aggregate is produced by Cedarapids crushing equipment which has been constantly improved to provide the utmost in quality of products, low cost, and volume of production.

When you are figuring peacetime contracts for highways, airports or other engineering construction, that have made America strong, base your estimate on aggregate produced by Cedarapids equipment. Even though a large part of Iowa's production is still going to war you can always get more Cedarapids equipment for essential civilian use. Let us help you with the necessary releases and priorities. Come to Iowa, first, the home of Cedarapids aggregate producing and crushing equipment.

IOWA MANUFACTURING COMPANY
CEDAR RAPIDS, IOWA

THE IOWA LINE

of Material Handling Equipment Includes

ROCK AND GRAVEL CRUSHERS
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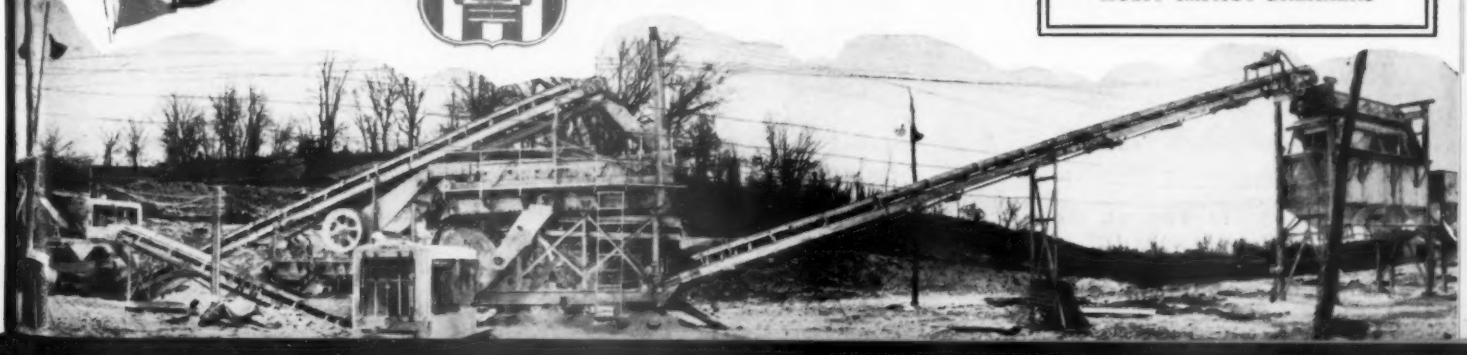
PORTABLE GRAVEL PLANTS
REDUCTION CRUSHERS
BATCH TYPE ASPHALT PLANTS
TRAVELING (ROAD MIX) PLANTS
DRAG SCRAPER TANKS
WASHING PLANTS
TRACTOR-CRUSHER PLANTS
STEEL TRUCKS AND TRAILERS
KUBIT IMPACT BREAKERS



READY AND WAITING

This Mack Model FC six-wheeler, with a capacity of 30 tons, is the largest standard truck built. It is especially adapted for use in quarries and strip mines, and for hauling of nickel, copper, iron and other ores.

THE post-war world won't be handed to us ready-made . . . but there will be a ready and waiting market for quarry and mining products. Housing, highways, perhaps new peacetime factories, dams and power-plants will keep supplier and builder busy for years.

Because of their proved ability to haul large tonnage at low cost, heavy duty motor trucks will have a vital part in this work, and far-sighted quarry and construction men are already giving close study to the selection of truck equipment best suited to their particular needs.

Plan *your* future operations now . . . with the advice of our engineers, men who know the job you face, and the kind of truck best fitted to do it. Address your inquiry to Public Works and Mines Division, Mack Trucks, Inc., 350 Fifth Ave., New York 1, New York.

Mack

TRUCKS FOR EVERY PURPOSE

ONE TON TO FORTY-FIVE TONS

BUY U. S. WAR BONDS

Mack Trucks, Inc., Empire State Building, New York 1, N. Y. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J. Factory branches and dealers in all principal cities for service and parts.

IF YOU'VE GOT A MACK, YOU'RE LUCKY . . . IF YOU PLAN TO GET ONE, YOU'RE WISE!

FOR GIVING FORCE TO A SLOGAN

From president to porter, everyone at Thermoid knows that continued prestige for Thermoid Products demands more than just a slogan . . . that Thermoid's leadership and growth depend solely upon the quantity and quality of effort contributed by each and every employee.

This concept of service is fostered by special honors awarded regularly for outstanding work. The most coveted of these awards is the "Achievement Medal" pictured here and conferred each year on the three men or women who most nearly reach "approximate human perfection" in performance of their duties.

By emphasizing the fact that an employee's own welfare is linked directly with the common good of company, fellow workers and customers, Thermoid is able to supply products and render services that give force to its slogan: "It's good business to do business with Thermoid".

Thermoid Rubber

DIVISION OF THERMOID COMPANY

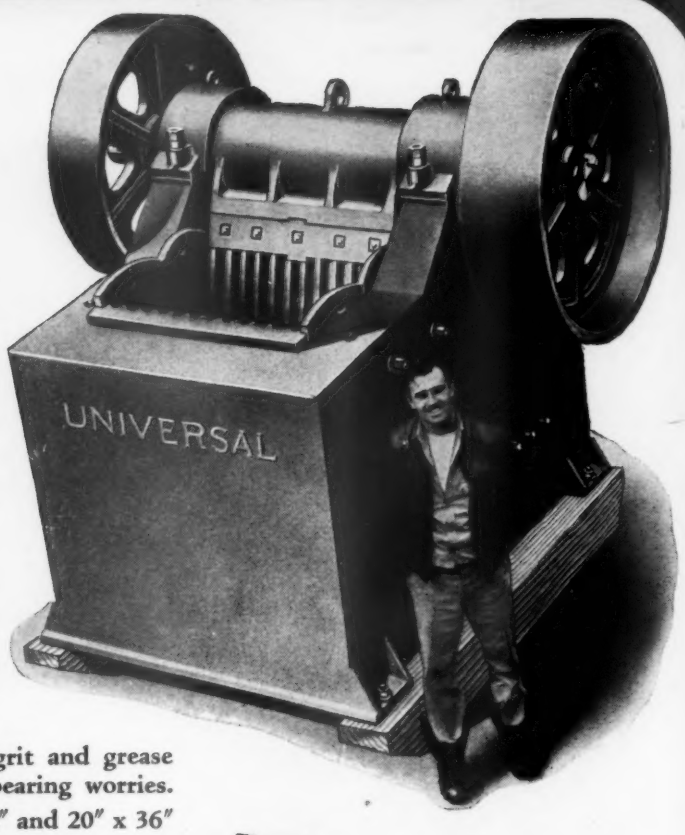
TRENTON, NEW JERSEY

THE THERMOID LINE INCLUDES: Transmission Belting • F.H.P. and Multiple V-Belts and Drives • Conveyor Belting • Elevator Belting • Wrapped and Molded Hose • Sheet Packings • Industrial Brake Linings and Friction Products • Molded Hard Rubber and Plastic Products.

It's Good Business to do Business with Thermoid

Don't put it off 'til tomorrow— BUY MORE WAR BONDS TODAY

This big bruiser is not as heavy as it looks (but it's tougher than it looks!)



Universal has led the field in eliminating dead-weight—we've done it again with the NEW "WRB" series *welded steel plate* crushers with cast steel pitmans. Not an ounce of excess metal, yet all the structural strength necessary to prevent distortion of frame or misalignment of bearings. Lateral and transverse ribbing and heavy plate side walls assure absolute stability.

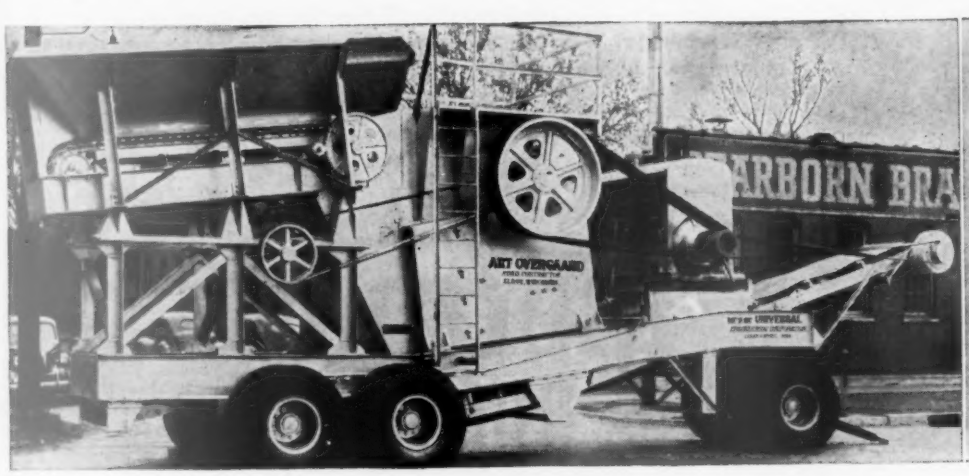
Four big SKF roller bearings—two on the pitman and one on each side—labyrinth sealed against grit and grease and Alemite lubricated, assuring freedom from bearing worries.

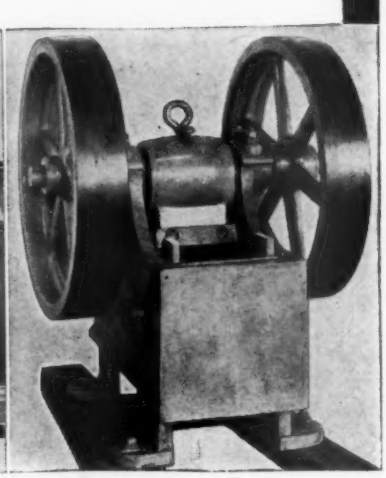
Two sizes available in the "WRB" series—30″ x 42″ and 20″ x 36″ feed openings; other sizes later.

A number of Universal "WRB" Crushers are in use. Users of the 30″ x 42″ report from 150 to 200 tons per hour of 4″ material. A 30″ x 42″ crusher on a primary crushing unit built for Art Overgaard, Elroy, Wisc. is shown below. Send for bulletin on the "WRB" line.

UNIVERSAL ENGINEERING CORPORATION
619 C Ave. West **Cedar Rapids, Ia.**

The overhead eccentric type jaw crusher, first built by Universal in 1906, has become the most widely accepted method for primary reduction of rock and gravel. While there have been improvements in materials, bearings and construction, there has been no major improvement in this basically sound method of crushing which provides two crushing blows with each revolution of the eccentric—a preliminary blow in the mouth of the crusher and a further reduction in the throat, at the bottom of the crusher. Some of these early crushers are still in use. The Universal "WRB" series employs this original highly efficient crushing principle.





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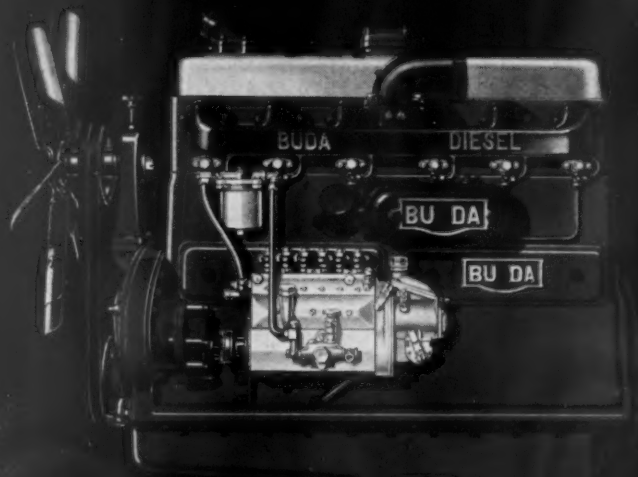
UNIVERSAL

CRUSHERS, PULVERIZERS, COMPLETE PLANTS, SPREADEROLLERS, PORTABLE ASPHALT PLANTS

Start Post-War Planning Now!



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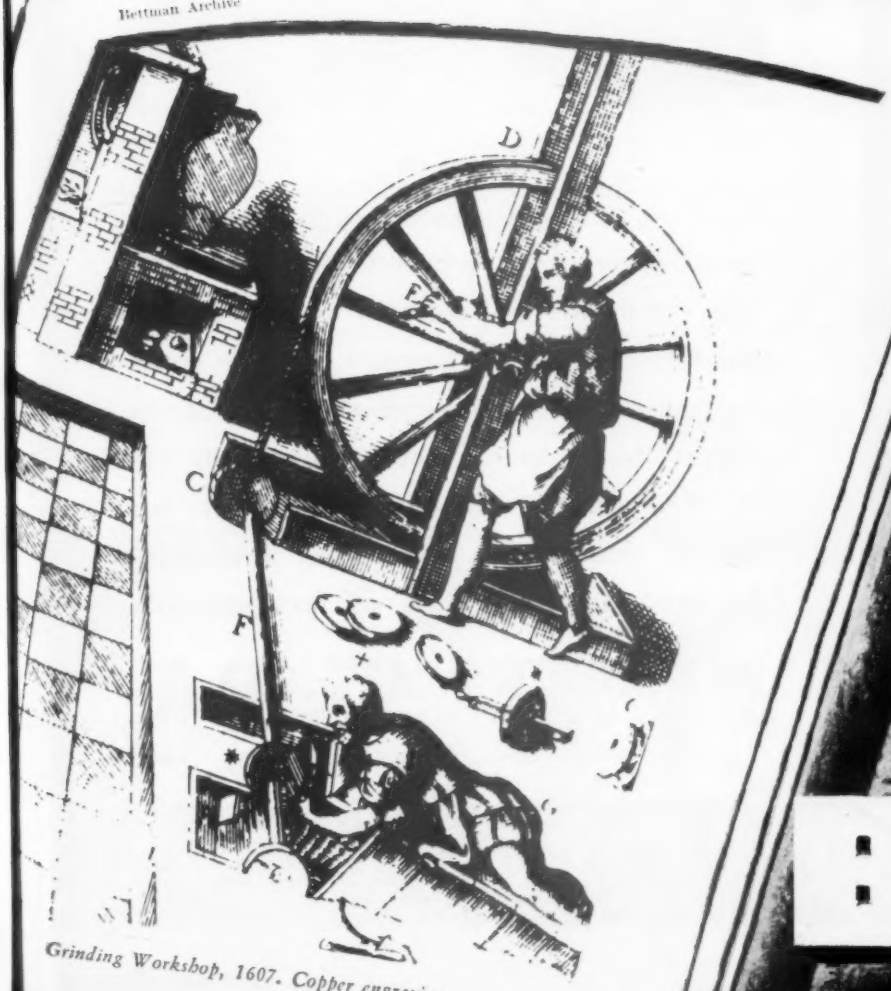
Service is
Nation-Wide

Bettman Archive



Grinding Workshop, 1607. Copper engraving.

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ARMY — E — NAVY

BUDA

Do That Fine Crushing WITH SHORT HEAD CONES..

For crushing to the finer sizes, whether ore, stone, gravel or slag, no crusher can match the performance of the Symons Short Head Cone for tonnage and low crushing cost. The large number now in service proves this claim. If your requirements call for fine crushing, here is the crusher that will do the job for you just as it is doing for most large producers of fine materials.

NORDBERG MFG. CO.
MILWAUKEE 7, WISCONSIN
CANADIAN OFFICE • CONCOURSE BLDG. • TORONTO

NORDBERG MACHINERY

SYMONS CONE CRUSHERS

How to *dream-plan* Cutting Loading Costs...

For one thing, you'll want to use the straight-line method—the continuous digging, lifting and loading by which a Haiss Loader delivers high speed loading capacity at such low cost.

For another thing you'll want mechanical reliability which has been the Haiss Loader's long suit from the very beginning. Simple, functional design, alloy steels, reliable power, heavy-duty clutches and gears—wholly enclosed and running in oil—and general low cost upkeep to which many hundreds of owners can bear witness.

Let us send you catalogs for your advance planning of more efficient loading.

A Memo of Things to be Sure of:—

1. *That your loading equipment is of capacity to keep trucks from losing time at the loading point.*

2. *That your Loader has sure-fire digging capacity—with a positive-acting self-feeding device—and an efficiently slow "Crowding" drive.*

3. *That your Loader has weight, stamina, and reserve power—ability to do a big job and stand up to hard usage.*

It will live up to all these things if it is a Haiss!

GEORGE HAISS MANUFACTURING CO., INC., 142nd & Rider Ave., New York 51, N.Y.

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Write, wire or phone for prices, catalogs and deliveries

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PORTABLE CONVEYORS ★ LOADERS ★ CLAMSHELL BUCKETS

WHAT'S THE ANSWER?

Never before have so many questions faced the American people as they do today. No wonder that perplexity is the common expression to be found wherever you go.

War . . . its very nature being that of destruction . . . disrupts the normal, sane way of living. Happily, recent events are causing the pendulum to take a gigantic swing toward the cause of the Allies, registering a tremendous increase since Pearl Harbor.

This very fact brings up many questions. Business men, and especially those engaged in Crushed Stone, Sand, Gravel, Concrete, Rock and kindred Industries, want to know about their source of supply in the post-war period.

As far as Industrial Rubber Goods are concerned, QUAKER, with 59 years of successful operation, is the logical answer.

Quaker's factory and management are devoted exclusively to the many products of Industrial Rubber Goods. Everyone at Quaker, from the chief executive to all employees, are all Industrial Rubber minded . . . no other product comes across our path to detract from our set purpose of producing this type of Quality merchandise.

Progressive Quaker offers outstanding qualifications that merit your consideration:

FINANCIAL—Quaker enjoys highest commercial rating.

PRODUCTION—Quaker, by thoughtful scheduling, with proper manufacturing supervision, enables increased tonnage each year.

TECHNICAL ASSISTANCE—Quaker's Sales Organization includes technical experts who are at your Service to assist you on any problems you may have regarding Belting, Hose or Packings.

DISTRIBUTION—Quaker enjoys national distribution of its products.

Keep Quaker in mind when you need a Conveyor or Transmission Belt; Hose for any purpose; Rod and Sheet Packings. Give Quaker serious consideration on all your Industrial Rubber Products.

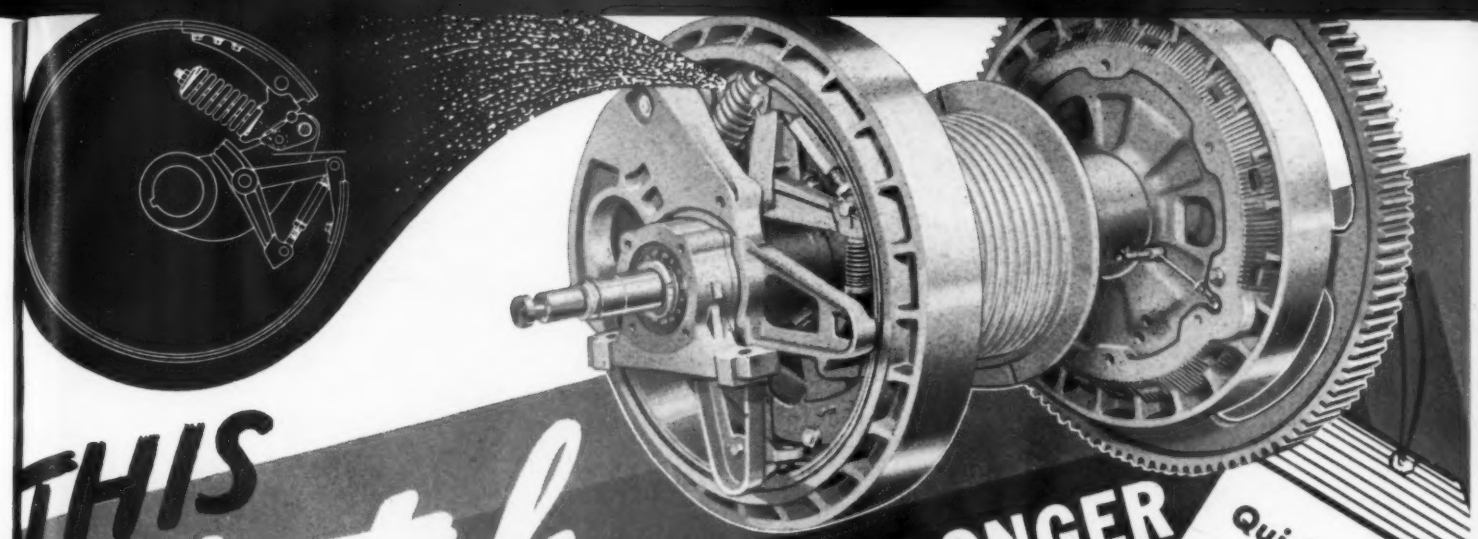
"If there is a way to get it done—Quaker will do it!"

QUAKER RUBBER CORPORATION

PHILADELPHIA 24, PA.

New York 7 • Cleveland 15 • Chicago 16 • Houston 1

Western Territory
QUAKER PACIFIC RUBBER CO.
SAN FRANCISCO 5 LOS ANGELES 21

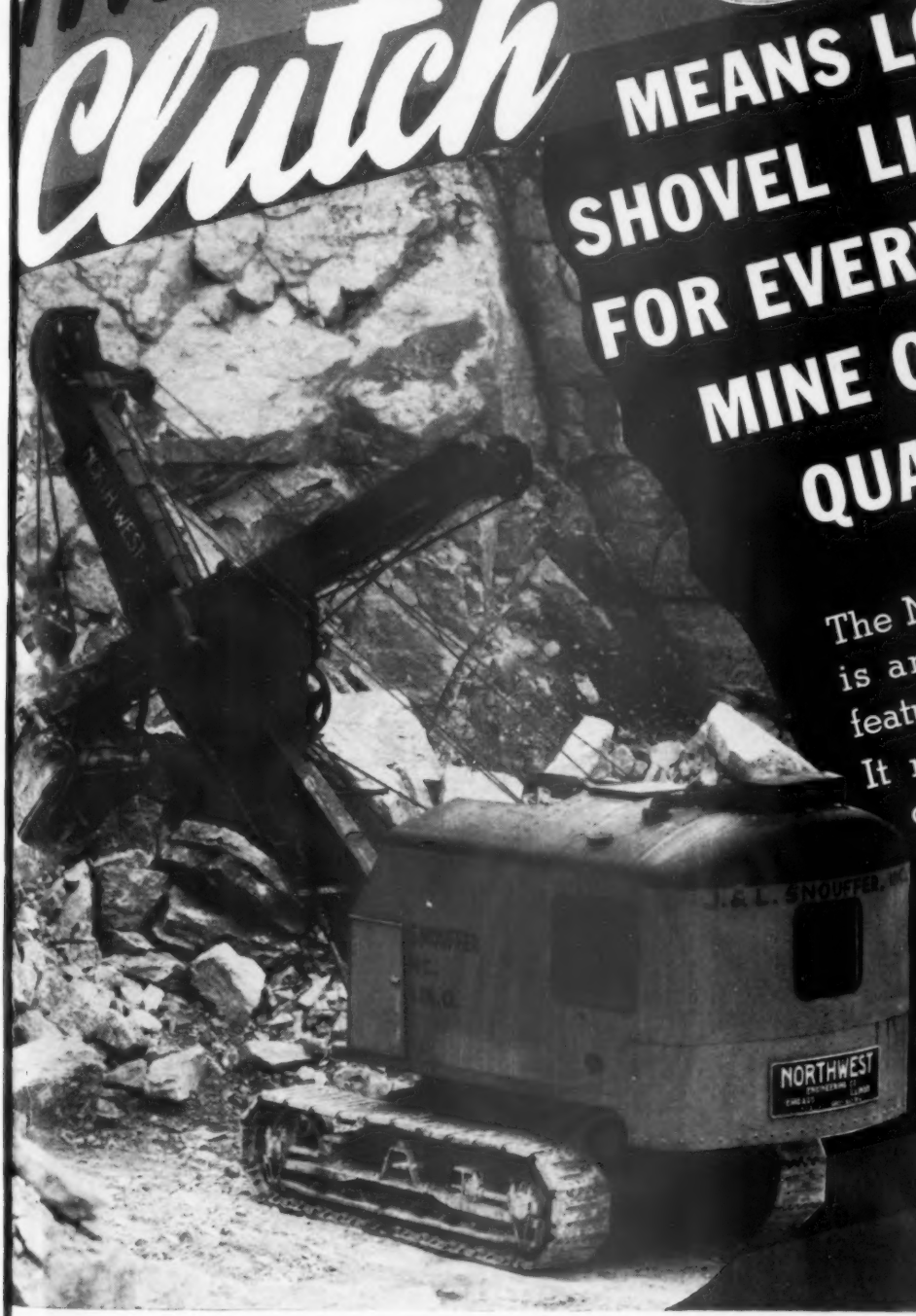


THIS clutch MEANS LONGER SHOVEL LIFE FOR EVERY MINE OR QUARRY!

Quick Shovel Information for the man that OK's the Purchase of Shovels

The Northwest cushion clutch is an exclusive Northwest feature.

It reduces overloads on the drum shaft and associated parts. It lengthens cable life. It reduces frequency of clutch adjustments and helps to make ample power safer.



If it's a real Rock Shovel you won't have to worry about output in dirt

ORTHWEST ENGINEERING CO., 1822 Steger Bldg., 28 E. Jackson Blvd., Chicago 4, Ill.

NORTHWEST

onvertible for any Mining, Material Handling or Excavation Problem

IN BINDING

ROCK OR DIRT DUMPED *Instantaneously*

MORE TRIPS PER HOUR

Time saved on the fill is time saved for every trip . . . more trips per hour . . . more production per shift. The Koehring Dumptor dumps any type material *instantaneously.* Seconds saved over mechanical dumping method speeds up every hauling and dumping job. Rock or dirt is dumped equally fast and the load is dumped clean every time . . . ready for a full load every trip.

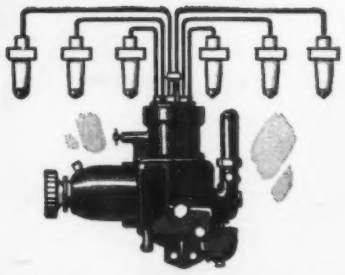
KOEHRING COMPANY
Milwaukee 10, Wisconsin

DEPEND ON YOUR KOEHRING DISTRIBUTOR
to help you keep your equipment operating. Care for your Koehring equipment *NOW*, so it will serve you tomorrow. Koehring distributors have genuine Koehring parts. Koehring parts warehouses are at your service.

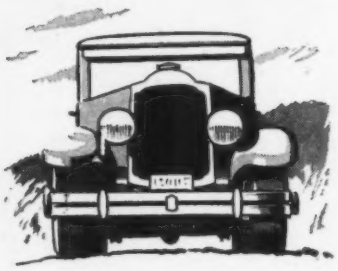
KOEHRING HEAVY DUTY

ARMY E NAVY

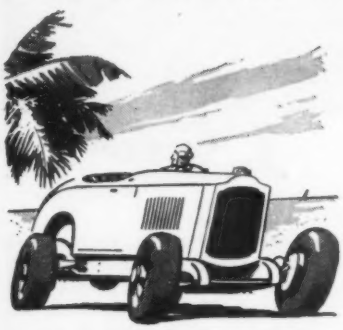
HEAVY-DUTY CONSTRUCTION EQUIPMENT



Dependable diesels are not built in a day. For instance, in perfecting the *exclusive* Cummins Fuel System, now an accepted model of simplicity and efficiency, 3,000 different injection mechanisms were developed and tested between 1923 and 1927 before Cummins engineers were satisfied. Insistence on "making it right," regardless of cost, explains why Cummins Diesels are known everywhere as *the dependable diesel.*



A Cummins-powered Packard sedan was the world's first diesel-propelled automotive vehicle. Driven in 1930 from Columbus, Ind., to New York City by designer-president C. L. Cummins at a fuel cost of only $1.38, the car was barred from the New York Auto Show and, later, the Atlantic City Road Show. Today, Cummins Diesels are found in practically all leading makes of heavy-duty trucks and construction equipment.



In 1930, under AAA sanction, the world's first official record for diesel-powered vehicles was established at Daytona Beach, Florida, by a Cummins Diesel installed in a Packard roadster—83 mph. The engine was a "dolled up" Model U designed for marine service. Although built to operate at 800 rpm., it was revved up as high as 1900 rpm. during the run, without any difficulties developing.

CUMMINS DEPENDABLE DIESELS

Automotive Models: Designed for all types of heavy-duty trucks in either highway or off-the-highway service.

★ ★ ★

Industrial Models: Portable and stationary engines, power units, and generating sets for service in any industry requiring heavy-duty power.

★ ★ ★

Marine Models: Propulsion engines and marine type generating sets designed for all types of fishing boats, work boats, and pleasure craft.

Makers and Breakers of Precedents in Power

In the early 20's, most authorities conceded 600 rpm. to be "tops" for a diesel. Cummins conceded nothing—bumped the Cummins Diesel of that early day up to 900 rpm. and kept right on bumping. That's how the modern, high speed diesel was created . . . by making *and breaking* one precedent after another . . . by doing things in design, construction and metallurgy "that couldn't be done." As a result, today's high speed Cummins Dependable Diesels are doing tough, heavy-duty jobs scarcely dreamed of twenty, or even ten, years ago. Not only doing them, but doing them cheaper, better and faster than they were ever done before. CUMMINS ENGINE COMPANY, INC., Columbus, Indiana.

Simple as A B C

A variety of B-G terminals are available in a wide range of types, sizes and horsepower to meet the length and width of belt required. Factory assembled and shipped as units ready for bolting to the conveyor frame. Eliminates field assembly of miscellaneous pulleys, bearings, etc. These standardized units are being used on some of the largest conveying jobs in the world—in processing plants, storing and reclaiming, and underground installations.

B-G conveyor frames range from channel to truss type, in depths to meet the span requirements. Lengthening a conveyor is a matter of adding the required number of sections. Terminal units attach directly to any section facilitating revamping of conveyor system. Standardized units simplify plant design and erection.

Carriers and return rollers are of all-steel construction, jig-welded to insure accuracy of alignment and furnish maximum strength with minimum weight. Available in roller, ball or plain bearings, and as troughing, flat, self-aligning, and special rubber impact carriers. Properly designed carriers standardized to provide uniformity prevent costly belt wear.

There is nothing complicated about using Barber-Greene standardized belt conveyor units. They are pre-engineered and designed for production manufacture. You can custom build your material handling and utilize interchangeable conveyor units. The B-G Conveyor Catalog 76 illustrates and tabulates the units available as standard manufacture. From this list, you select the equipment fitted to your needs. Barber-Greene engineers and mining consultants can help you plan for now and for future expansion.

44-80

BARBER GREENE

AURORA, ILL., U. S. A.

Shovels Are Weapons, Too

Good Blasting Will Make 'Em Last Longer

Shovels are weapons, today. They deserve the best. An effective "preservative" is good blasting. Extra explosive for better breakage can be money well spent.

But, maybe you don't need more explosive—just a different one to get better results. Consider, for example:

ATLAS EXTRA DYNAMITES (*Ammonia Dynamites*) Medium velocity. Heaving and stressing action. A good, all-around construction and quarry explosive, particularly suited for dry work.

ATLAS EXTRA DYNAMITES (AMMONIA DYNAMITES)

GRADE	% Weight Strength	Velocity, feet per second, in the open 1¼" x 8"	Velocity, feet per second, confined in pipe 1½" x 8"	MINIMUM NUMBER OF 8" CARTRIDGES PER 50 LBS. (MAXIMUM 10% MORE)								
				⅞"	1"	1⅛"	1¼"	1½"	1¾"	2"	4"	5"
60%	60	12000	17000	208	160	128	105	72	54	41	11	7
50%	50	10500	13000	208	160	128	105	72	54	41	11	7
45%	45	10000	12900	208	160	128	105	72	54	41	11	7
40%	40	9300	12000	208	160	128	105	72	54	41	11	7
33%	33	8900	11500	208	160	128	105	72	54	41	11	7
30%	30	8500	11000	208	160	128	105	72	54	41	11	7
25%	25	8200	10500	208	160	128	105	72	54	41	11	7
20%	20	7800	10000	208	160	128	105	72	54	41	11	7
15%	15	7300	8500	208	160	128	105	72	54	41	11	7

***Synergism**—*The meeting of minds "clicking together" from the impact of ideas to give a result greater than the sum total of the ideas expressed—a "2 + 2 = 5" result. Synergism is a big help toward making your equipment last longer.*

As important as the type of explosive you use is the way in which you use it. If you have a blasting problem, we would like to try synergistic thinking with you.*

ATLAS EXPLOSIVES *"Everything for Blasting"*

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington 99, Del. • Offices in principal cities • Cable Address—Atpowco

20% to 40% lighter...

type for type

Permits use of larger volume bucket on your machine . . . . regardless of <u>normal</u> capacity!

Here's the bucket every excavating contractor and dragline operator has dreamed of and wished for. A bucket that's light yet strong, unsurpassed for wet or dry digging, easy to handle, and with inbuilt durability to give years of trouble-free service. Light enough, even in the larger sizes, to maintain allowable loaded weight when used on small machines or on long boom.

If you want to speed up your operations under all digging conditions . . . move *more* material *faster* . . . you need Hendrix Lightweight Buckets for your draglines. Write today for descriptive literature, specifications and prices *or ask your dealer.*

1. **ALL WELDED CONSTRUCTION . . . *no rivets***
2. **10% to 14% MANGANESE STEEL CHAINS and FITTINGS**
3. **20% to 40% LIGHTER THAN OTHER BUCKETS, *type for type***
4. **GETS FULL LOAD OF PAY MATERIAL EVERY TRIP *even in wet digging***
5. **PERFECT BALANCE *for ease of handling***

HENDRIX *Lightweight* **DRAGLINE BUCKETS**

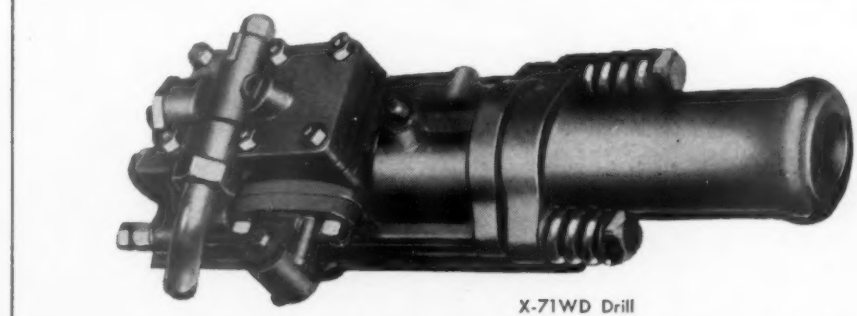
DESOTO FOUNDRY, INC. • MANSFIELD, LOUISIANA

The X-71WD drill is designed especially for deep-hole drilling. Its heavy piston, the heaviest used in any hammer drill, has an extremely long stroke and hits the drill steel a solid, powerful blow.

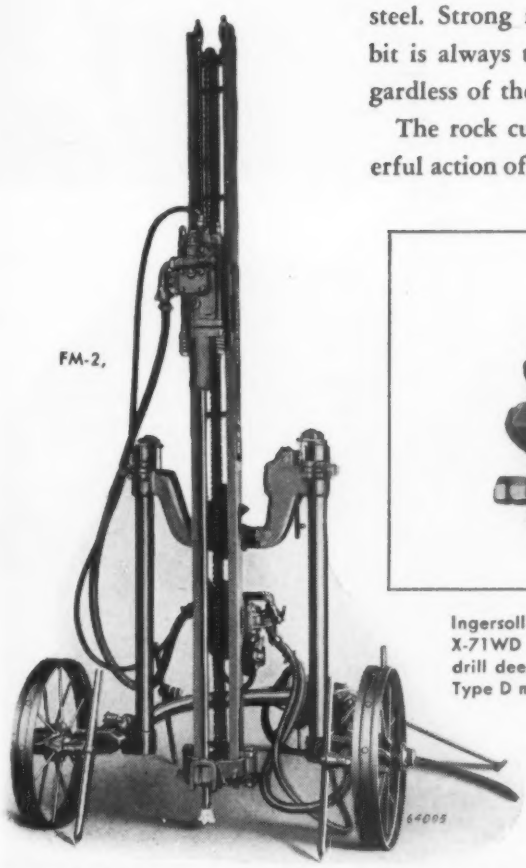
Added to this slugging power is a unique follow-through characteristic which overcomes the inertia of heavy drill steel. Strong rotation results; hence the bit is always taking deep, fresh bites regardless of the hardness of the rock.

The rock cuttings created by the powerful action of the drill are easily removed by a new method of blowing which greatly reduces the loss of air around the drill steel shank. As a result, the high pressure so necessary for cleaning deep holes is maintained.

These operating features, plus the ruggedness and stamina which are essential qualities of a champion, will help you drill more feet of hole day in and day out. The use of Jackbits in conjunction with the drilling power of the X-71WD will give you even better results. Jackbits are available in sizes ranging from 1⅜ to 4½ inches.



X-71WD Drill



FM-2,

Ingersoll-Rand has developed two wagon mountings to provide portability for the powerful X-71WD Drill. The FM-2, shown at the left, is an extremely flexible 3-wheeled mounting. It will drill deep holes at any angle and will handle six-foot steel changes. Then there is the improved Type D mounting which is used for 10 or 15-foot steel changes, and for holes to a depth of 40 feet.

Ingersoll-Rand

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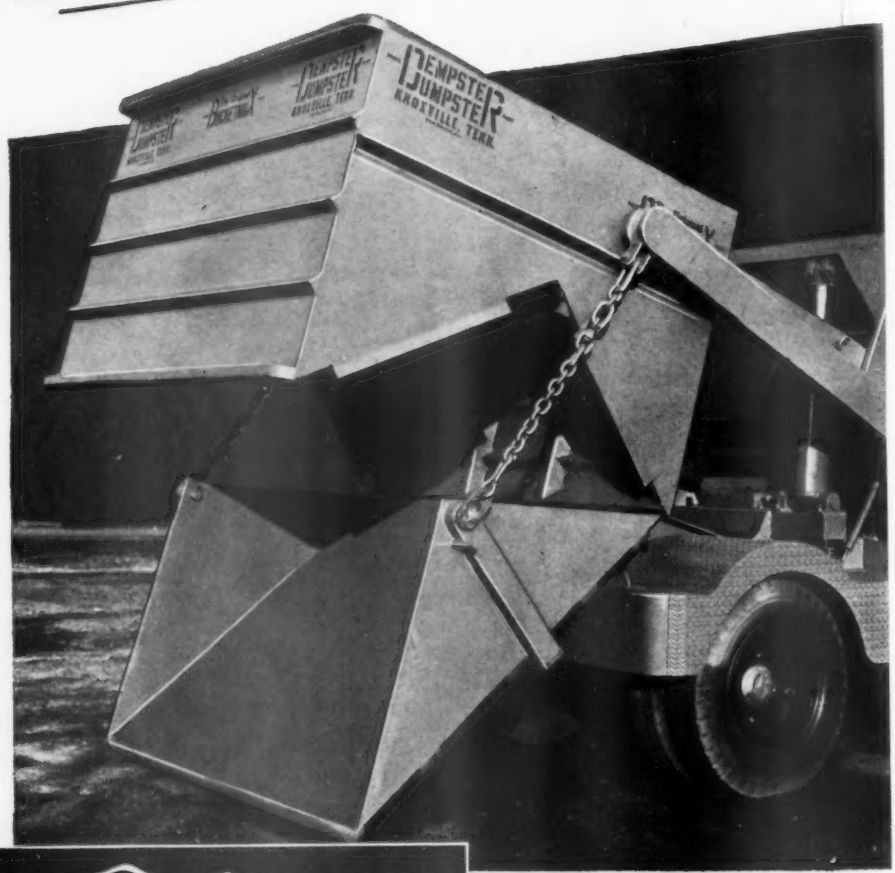
☆ *To see it in operation means convincing yourself, at once, that one truck equipped with a Dempster-Dumpster will do the work of 3 to 5 of your present trucks.*

DEMPSTER DUMPSTER

TRADE MARK REG.



HOW THE DEMPSTER-DUMPSTER SYSTEM OF MATERIALS HANDLING WORKS

1—One Dempster-Dumpster Hoisting Unit serves any number of bodies, depending primarily upon the time required for loading bodies, frequency between required dumping and distance of haul. One plant uses 75 bodies to one hoisting unit.

2—Bodies are placed at strategic points of loading. In some plants, several different types of bodies are used for entirely different classes of materials, but all are serviced by the same hoisting unit.

3—As each body is loaded, hoisting unit picks up loaded body and automatically places it in carrying position, all under full control at truck driver's seat.

4—Load is hauled to point of disposal where it is automatically dumped or lowered to floor position intact if preferred. If dumped, empty body is returned to point of loading. One truck in a never ending cycle of full service with no standing idle time for truck or driver is the result.

There Is A DEMPSTER-DUMPSTER Built For Every Materials Handling Problem

DEMPSTER BROTHERS, INC.

Knoxville 17, Tennessee

Nitro Starch Base

High Explosive Efficiency

IN MINING · QUARRYING · LOGGING AND CONSTRUCTION

EXPLOSIVES 1905 TROJAN 1944 CHEMICALS

Plus THREE ADVANTAGES FOR YOU!

WILL NOT PRODUCE HEADACHES from handling . . . reduces discomfort from breathing muck pile fumes. Better working conditions for you and your men!

WILL NOT FREEZE or leak at Arctic or Tropic temperatures. Maintained high efficiency . . . anywhere . . . anytime!

WITHSTANDS IMPACTS in high-powered Rifle Bullet Test. Greater Safety for workers!

With Allied fury mounting in battle areas all over the world, many have gained new hope, new assurance, that the light of peace has at last risen above the horizon of war. When that glorious day dawns in all its brilliance, Trojan Products will be chosen by many for the construction and development of better things for the better living ahead.

BUY MORE BONDS!

TROJAN POWDER COMPANY

ONE OF AMERICA'S OLDEST HIGH EXPLOSIVES MANUFACTURERS

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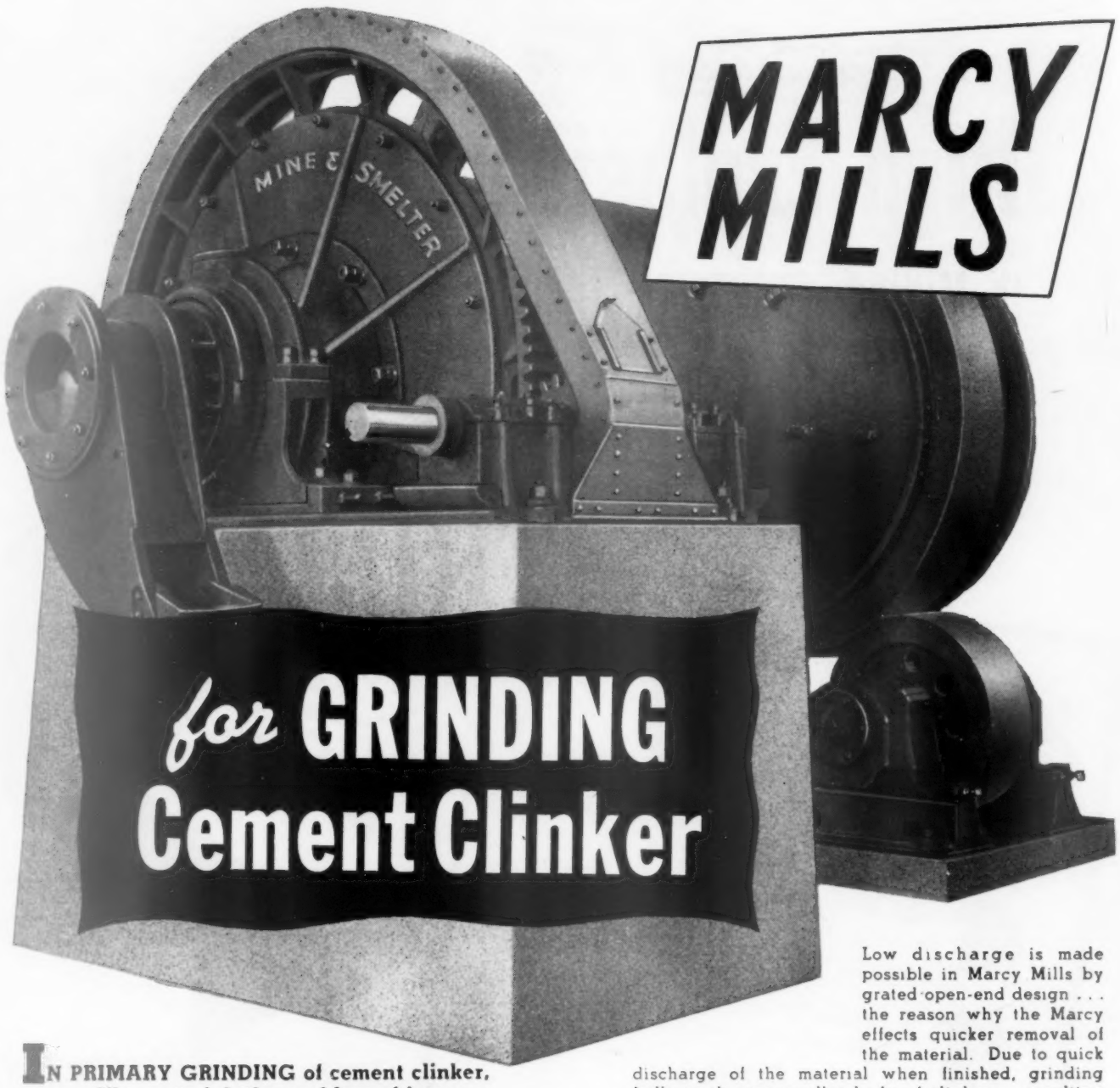
OFFICES: ALLENTOWN, PA. • SAN FRANCISCO, CAL. • LOS ANGELES, CAL. • PORTLAND, ORE. • NEW YORK, N. Y.



MARCY MILLS

for GRINDING Cement Clinker

Low discharge is made possible in Marcy Mills by grated open-end design . . . the reason why the Marcy effects quicker removal of the material. Due to quick discharge of the material when finished, grinding balls work on a smaller body of clinker — resulting in more useful work from the grinding media.

IN PRIMARY GRINDING of cement clinker, or any like material, the problem of increasing tonnage is usually considered a matter of increasing the SIZE of the grinding units. Without using a larger mill, the Marcy gets more tonnage—and lower grinding cost per ton — simply by discharging the product from the mill as soon as the grinding is completed, without wasteful over-grinding . . . . If you are now planning for tomorrow's necessarily lower costs, let us have a look at your drafting boards.

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Genuine Wilfley Tables; Massco-McCarthy Hot Millers; Rock Bit Grinders; Density Controllers; Belt Feeders; Pinch Valves; LABORATORY EQUIPMENT; MINE & MILL SUPPLIES; COMPLETE MILLING PLANTS.

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Multiwall Paper Bags are required for industrial shipments of food products, chemicals, fertilizers, and construction materials — for domestic use and overseas to our armed forces and civilian populations of allied nations and occupied countries.

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Yes, piping costs spiral down when you use Taylor Spiral

In too many plants the only pipe specification ever written for the ordinary run of piping is the *size* of the pipe on the purchase order. If someone suddenly asked, "What *kind* of pipe do you want?", the startled reply would probably be, "Why just *pipe*, brother!"

"Just pipe" means Standard Thickness pipe, of course. It's perfectly good pipe for most moderate and low pressure piping, but it's rather costly to think of Standard Thickness as the *only* pipe for these everyday services.

It just happens that there is another *kind* of pipe — light-but-rugged Taylor Spiral — that can be very profitably used for most of those applications where Standard Thickness pipe is ordinarily used. The spiral construction of Taylor Spiral Pipe gives it remarkable strength in proportion to its wall thickness . . . makes it the strongest type of pipe of its weight . . . enables it to handle the kind of applications listed below with strength and service life to spare. Still more important, its installed cost is often no more than half that of the heavier pipe it so well replaces.

Adopting Taylor Spiral Pipe for services like those listed is made easy by the complete range of sizes, wall thicknesses and fittings. Thicknesses range from 18 to 6 gauge; sizes from 4" to 42"; joint lengths up to 40 ft. All types of end joints and couplings, all kinds of fittings and specials or fabricated assemblies, are produced by Taylor Forge providing a complete service with undivided responsibility. Next time consider the *kind* of pipe; not just the size!

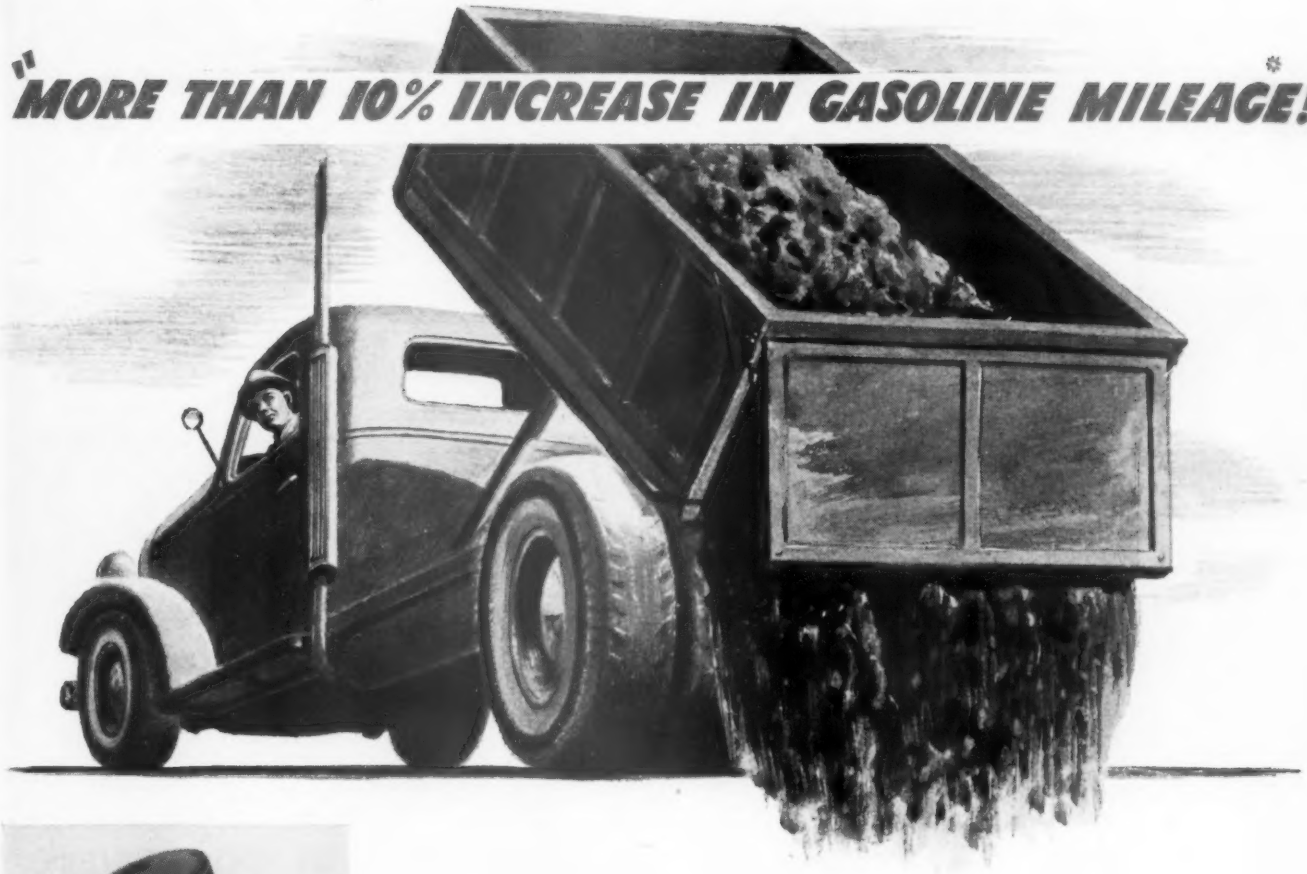
TAYLOR FORGE & PIPE WORKS

General Offices & Works: Chicago, P. O. Box 485 ★ New York Office: 50 Church St. ★ Philadelphia Office: Broad Street Station Bldg.

CHANGE TO TAYLOR SPIRAL PIPE FOR:

- High and Low Pressure Water Lines
- Low Pressure Steam and Air Lines
- Steam and Diesel Exhaust Lines
- Vacuum and Suction Lines
- Blower Piping
- Sand and Gravel Lines
- Industrial Gas Lines
- Oil and Gas Gathering Lines
- Swing Pipe
- Spray Pond Piping
- Hydraulic Mining
- Dredge Lines

"MORE THAN 10% INCREASE IN GASOLINE MILEAGE!*"



Ring-Free removes carbon. Keeps pistons clean, rings free. Reduces power loss.

Ring-Free's high film strength and long cling make bearings last longer, even under overloads.

Ring-Free holds foreign particles in suspension... stops sludge formation, reduces port clogging.

You'll move more tons of material per gallon of fuel consumed if you use Macmillan Ring-Free Motor Oil. That is a simple statement of fact, and the reasons are very easy to explain.

It takes *power* to move material. It also takes power to *overcome internal engine friction.* The more internal friction is reduced, the more power you'll have for hauling material, or other productive work.

Ring-Free Motor Oil cuts friction-power-loss materially, because it *reduces friction fast.* It lubricates better because it removes carbon, has high film strength, long cling and thorough penetration.

***TESTED AND PROVED ON THE JOB**

Operators everywhere find their engines run better and last longer when lubricated with Ring-Free. Power is increased, shut-downs and repairs are decreased. Operating and maintenance costs go down, production and profits go up.

You, too, will notice *immediate improvement* when you change to Ring-Free. Give it the hardest tests you can, on your toughest jobs. It will effectively answer many of your difficulties.

**"For the past seven years I have been using Ring-Free Motor Oil in my fleet. I get from seventy to eighty thousand miles before changing motors or being forced to make any major repairs. I never have any sticky valves and but slight traces of carbon, and my gasoline mileage has increased more than ten per cent."*

Henry J. Schafer, Jr., Pres.
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MACMILLAN RING-FREE MOTOR OIL

MACMILLAN PETROLEUM CORPORATION

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Save Money with PRIMACORD

One of the big advantages of Primacord shooting is the ease with which you can handle large blasts. As many as 4,000 6-in. holes have been hooked up with 38 miles of detonating fuse and fired as one giant blast.

If you wish to increase the number of holes per blast, you can count upon Primacord to go all the way with you. It detonates every cartridge in every hole and connects all holes in a planned sequence that delivers good digging rock. There is really no limit to the number of holes that can be detonated practically simultaneously with Primacord — and larger blasts have been found to offer many economies . . .

PRIMACORD-BICKFORD
Detonating Fuse
Manufacturers of Safety Fuse since 1836

19

THE ENSIGN-BICKFORD COMPANY • SIMSBURY, CONNECTICUT

One name stands out

PIONEER

From the day when the first Pioneer Portable gravel plant was towed to a road-side pit to produce aggregate for Wisconsin's specifications, one name has stood out. In pit, quarry and mine you see the name Pioneer on gravel plants, washers, crushers, screens, conveyors, bituminous plants. Pioneer leads in the qualities that make equipment pay.

Pioneer stands for sensible, simple engineering—design that meets the job requirements—rugged construction for rugged work—low maintenance costs.

That these dependable qualities are present in greater measure in Pioneer equipment is manifest by the many contractors who year after year have relied exclusively on Pioneer.

Pioneer is proved equipment — and the right combination of Pioneer units will make more money for you. Pioneer engineers are ready to help you now.

Pioneer
ENGINEERING WORKS
Jaw Crushers • Roll Crushers • Screens • Conveyors • Feeders • Washers
MINNEAPOLIS 13, MINNESOTA

ENGINEERS and MANUFACTURERS of QUARRY-GRAVEL AND MINING MACHINERY

Control SAND MOISTURE

with AKINS *Classifiers*

TO CUT TIME & COST IN MIXING

and to make BETTER CONCRETE

NO cement contractor wants variation in the moisture content of the sand he uses — because moisture variation either produces concrete of uneven quality or adds time and cost in mixing — or both. Show him that you can supply sand with uniform moisture and you have something more than sand to sell him.

AKINS Classifiers are well adapted mechanically for controlling moisture and are especially suited to washing sands to close specifications, such as required for glass making. AKINS Classifiers do not require unloading after shutdowns. Power and upkeep requirements are very low, considering the high tonnages handled.

LET US WORK WITH YOU ON POST WAR PLANS.

SKINNER MULTIPLE HEARTH ROASTER

•

LOWDEN DRYERS

•

SMELTING EQUIPMENT

AKINS

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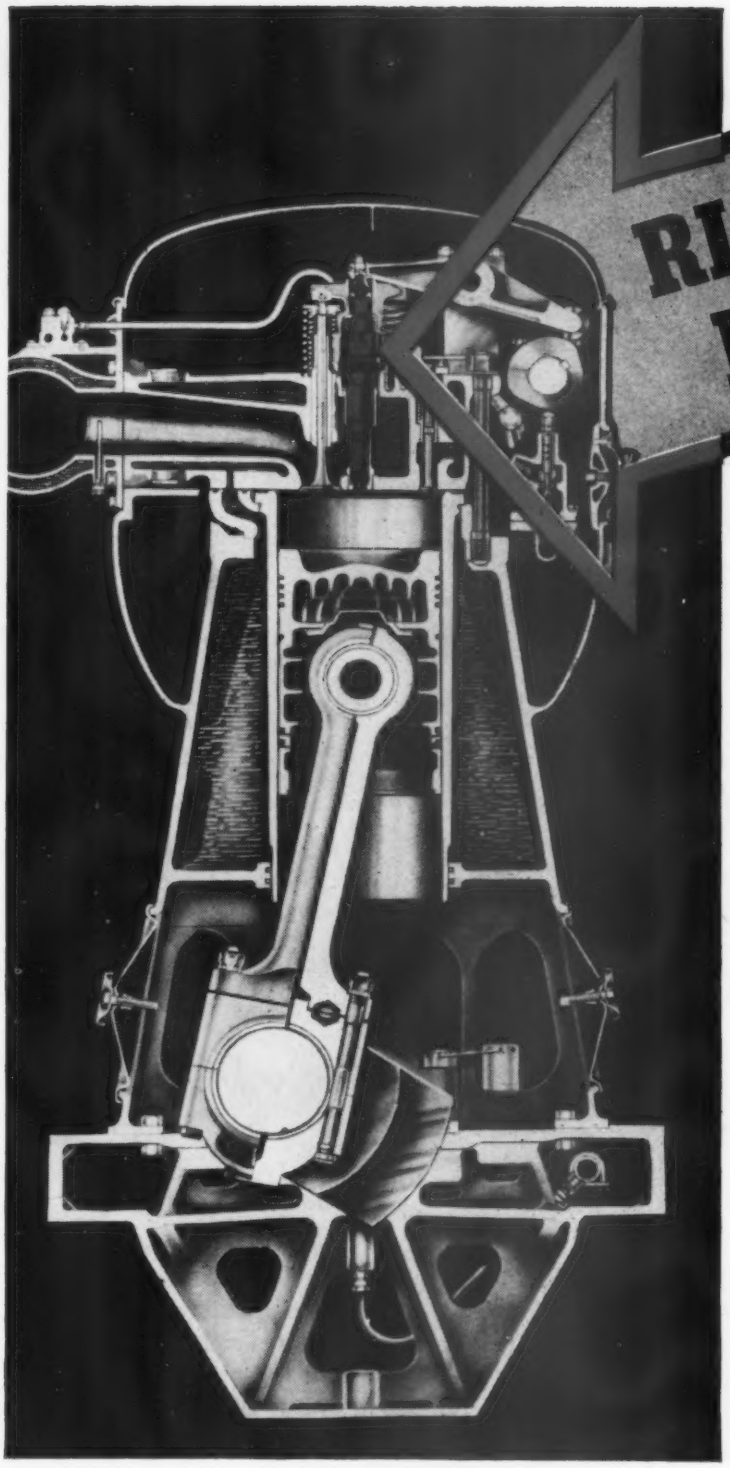

RIGHT WHERE IT BELONGS!

The unit-type fuel injector in Hendy Diesel Engines is right in the head...*logically* placed for satisfactory service under all load conditions, with *uniform* high-pressure fuel charge to *each* cylinder. This injection system provides individual fuel pumps for each cylinder...does away with long, high-pressure fuel lines... simplifies service because the entire unit can be easily removed for cleaning.

In addition to the unit-type fuel injector you'll find other important features too, such as...overhead camshaft, direct actuated dual intake and exhaust valves, and hydraulic tappets. All these features, *combined for the first time in a single engine,* reduce the number of wear points, simplify service and contribute directly to the lower maintenance costs a successful Diesel operator must have.

In marine service—or for stationary duty—Hendy Diesels can serve you well. They combine two great qualities...all the ruggedness for rough seas; all the good features for low-cost operation.

Hendy Diesels for marine or industrial service... 6 or 8 cylinders, 350 to 675 hp... are also available with Hendy generators as complete electric generating plants.

Hendy is currently supplying 250 kw Diesel generating sets for a large number of AVI cargo ships.
HENDY
DIESEL
ENGINES
50

Write today for complete data—ask for the New Hendy Series 50 Diesel Engine Catalog.

JOSHUA HENDY IRON WORKS

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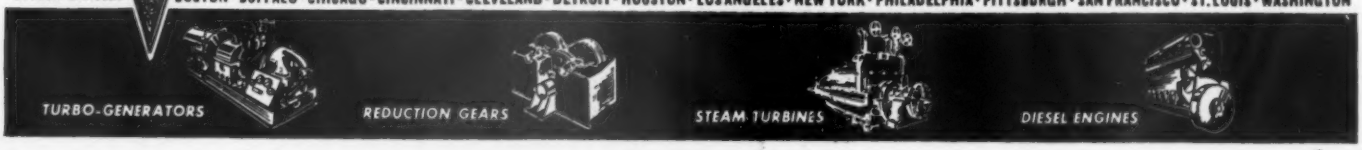


Continuous Supplies...

CALL FOR MOUNTING DOLLARS

Official U. S. Coast Guard photo

Official U. S. Marine Corps photo

....STEP UP YOUR PAY ROLL PLAN!

War is a continuous job.

Ever-widening, ever-advancing fighting fronts call for a never-ending flow of manpower and materiel—*financed by a continuous flow of money.*

Your responsibility as top management increases with the mounting tide of battle. You've been entrusted with two major responsibilities—steadily maintained production, and steadily maintained War Bond Sales through your Pay Roll Savings Plan.

So keep this one salient fact before you at all times: *The backbone of our vital war financing operation is your Pay Roll Savings Plan.*

Your job is to keep it constantly revitalized. See to it that not a single new or old employee is left unchecked. See to it that your Team Captains solicit everyone for regular week-in and week-out subscriptions. And raise all percentage figures wherever possible.

Don't underestimate the importance of this task. This marginal group represents a potential total sales increase of 25% to 30% on all Pay Roll Plans.

Constant vigilance, in a quiet way, is necessary to keep your Pay Roll Savings at an all-time high. Don't ease up—*until the War is won!*

The Treasury Department acknowledges with appreciation the publication of this message by:

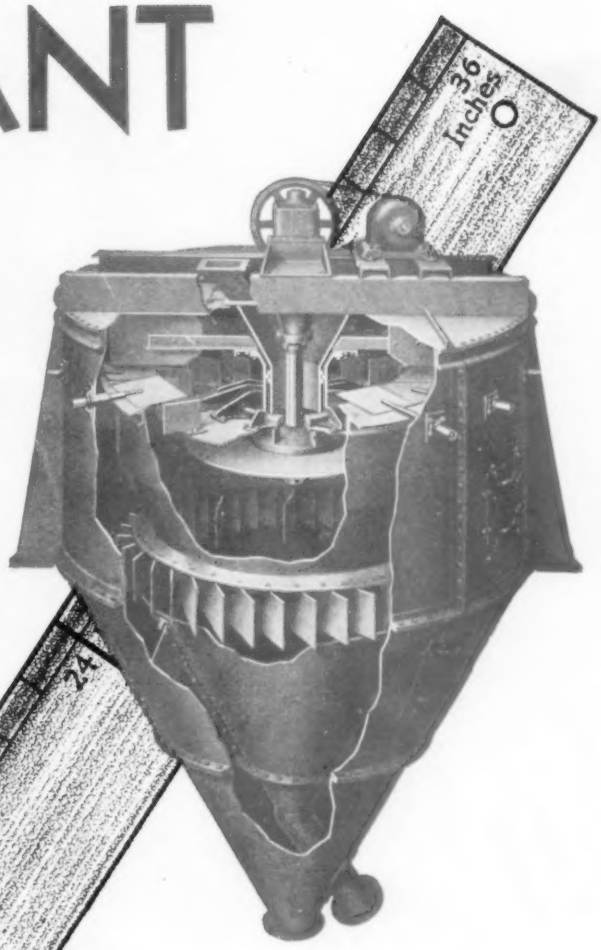
Back the Attack!

SELL MORE THAN BEFORE!

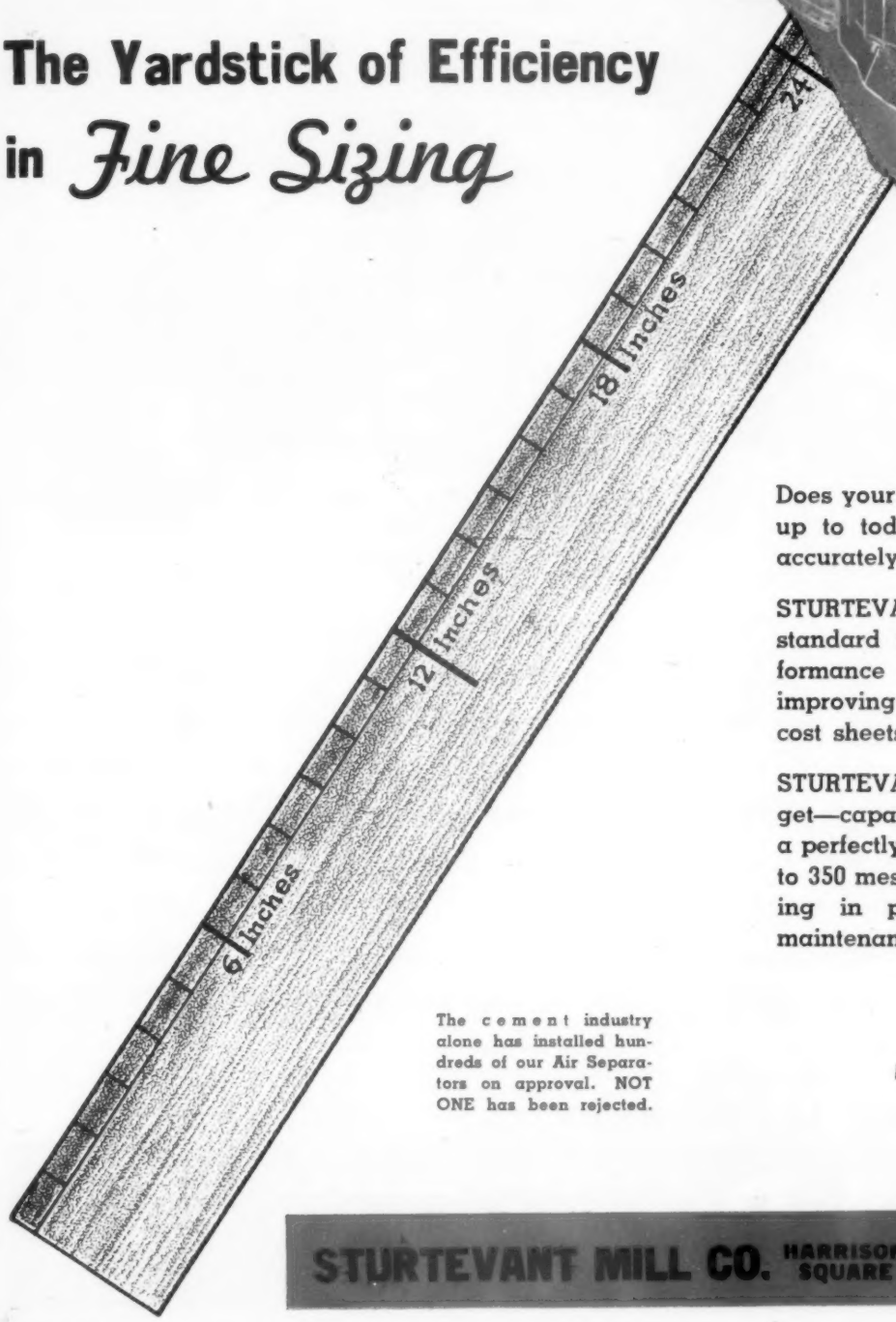
PIT AND QUARRY

This is an official U. S. Treasury advertisement prepared under the auspices of Treasury Department and War Advertising Council

STURTEVANT
AIR SEPARATOR



The Yardstick of Efficiency in *Fine Sizing*



Does your separating plant measure up to today's urgent demands for accurately sized materials?

STURTEVANT Air Separators — a standard unit for all "round" performance — offer a sure means of improving your output figures and cost sheets.

STURTEVANT owners expect — and get—capacity increases up to 300%, a perfectly uniform product in the 40 to 350 mesh range, and marked saving in power requirements and maintenance.

The cement industry alone has installed hundreds of our Air Separators on approval. NOT ONE has been rejected.

Write for Information

STURTEVANT MILL CO. HARRISON SQUARE **Boston 22, Mass.**

NO Compromise HERE!

Rear-Dump and Bottom-Dump EUCLIDS are designed and built for a single purpose — to move earth, rock, coal, ore and other materials on off-the-highway hauls with speed and economy. Planetary type full-floating drive axle, greater flotation and tractive power, and heavy construction throughout . . . all of these features make Euclid equipment outstanding for dependable performance and lower hauling costs.

Because they are built exclusively for hauling large loads on difficult hauls, there is no compromise in the design or the construction of Euclids. Weight is kept to a minimum consistent with large capacity and long life on tough jobs. Hundreds of earth moving contractors, and industrial owners too, have proved conclusively that Euclids cost less to own and operate on both long and short hauls.

The EUCLID ROAD MACHINERY Co. · · · Cleveland 17, Ohio

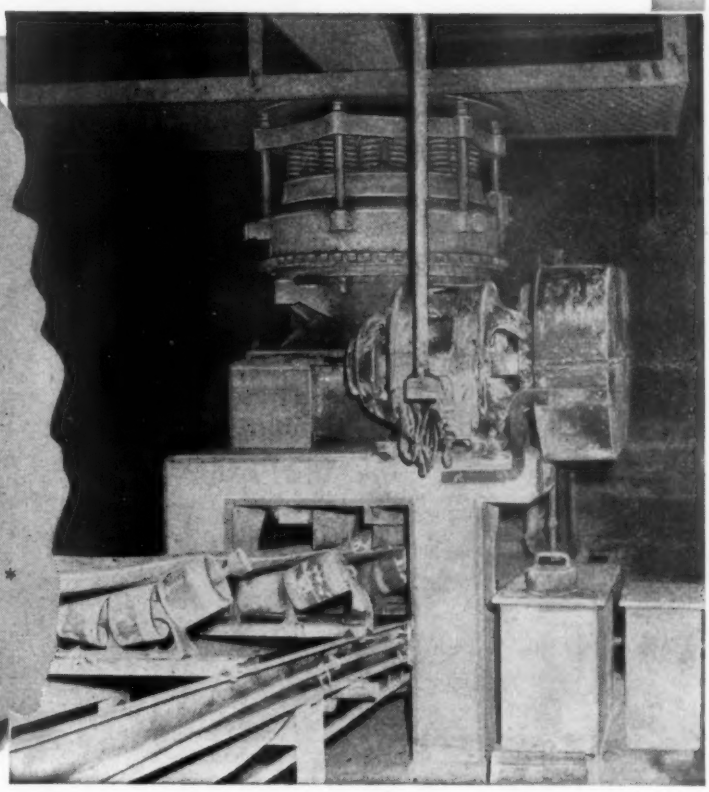
EUCLID SELF-POWERED HAULING EQUIPMENT For EARTH ROCK COAL ORE

How to Crush
330,000 TONS OF CLINKER AT NO COST FOR REPLACEMENTS

"We have put approximately 330,000 tons of clinker through the Telsmith Gyrasphere since installation of the crusher in March 1940. Operation has been entirely satisfactory and we have not found it necessary to replace any part of the Gyrasphere."

—— PORTLAND CEMENT COMPANY *

*NAME ON REQUEST



TELSMITH
Gyrasphere SECONDARY CRUSHER

Crushing Portland cement clinker...to a minus 3/8" or minus 1/4" product...330,000 tons of it...over four years of steady crushing..but not one cent for repair expense, except for replaceable oil filters! The crusher is a Telsmith Gyrasphere Secondary Crusher. And its owner is a mid-western Portland cement company (name given on request).

In their system of handling, clinker goes from storage to the Gyrasphere crusher...and then direct to the clinker mills. Owing to limited storage space, clinker is fed to the crusher very hot...over 300 degrees! The crusher gets hot, too—its lubricating oil is water-cooled. In the Telsmith Gyrasphere *double protectors*... four flexible labyrinth seals plus two piston rings...cut oil and maintenance costs to a new low.

Find out *how* you can get finer crushing, continuous operation, greater capacity...with less trouble, less power, less upkeep. Get Bulletin Y-15. Y-6

SMITH ENGINEERING WORKS, 504 E. CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

Cable Addresses: Sengworks, Milwaukee—Concrete, London

51 East 42nd St. New York 17, N. Y.
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Rish Equipment Co. Charleston 22 & Clarksburg, W. Va.
Rish Equipment Co. Roanoke 7 & Richmond, Va.
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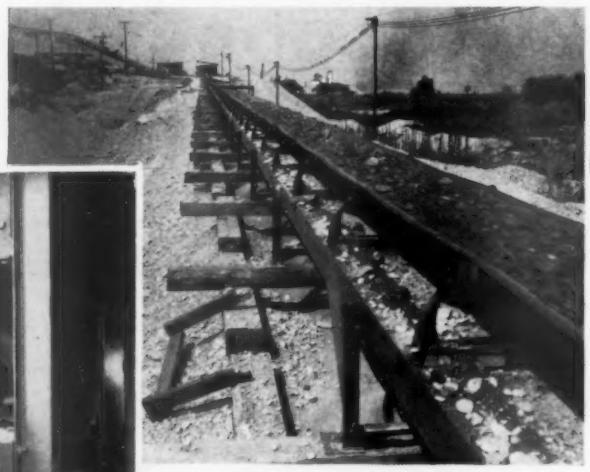
Continental BELT CONVEYORS

SAVE MAN HOURS—CUT MAINTENANCE COSTS

at OHIO GRAVEL COMPANY



IN order to conserve manpower and eliminate excessive maintenance, Ohio Gravel Company decided to use a belt conveyor in place of their cable car and hoist equipment, hauling gravel from the hopper at their gravel pit to an existing belt conveyor.

Continental was called upon to furnish this entire belt conveyor with exception of the drive which was on hand. Continental's belt conveyor has fully met the expectation of the management in handling approximately 175 tons of gravel per hour a distance of about 630 feet.

FOR THE WAR EFFORT

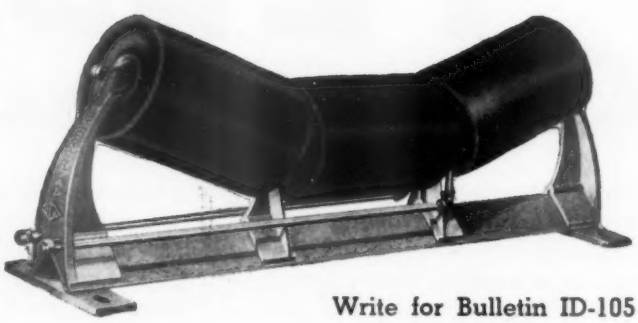
★ ★ ★ ★

Pennant awarded
October, 1941
1st renewal (Star)
May, 1942
2nd renewal (Star)
October, 1942
3rd renewal (Star)
April, 1943
4th renewal (Star)
December, 1943

Continental idlers are made in a complete range of sizes with steel, cast iron or rubber covered rolls for every type of service. All idlers are equipped with anti-friction bearings protected by labyrinth seals and amply supplied with lubricant by large grease reservoirs.

A complete line of belt conveyor accessories combined with engineering "know how" provides Continental with the means of solving your conveying problem too.

CONTINENTAL BELT CONVEYOR IDLERS



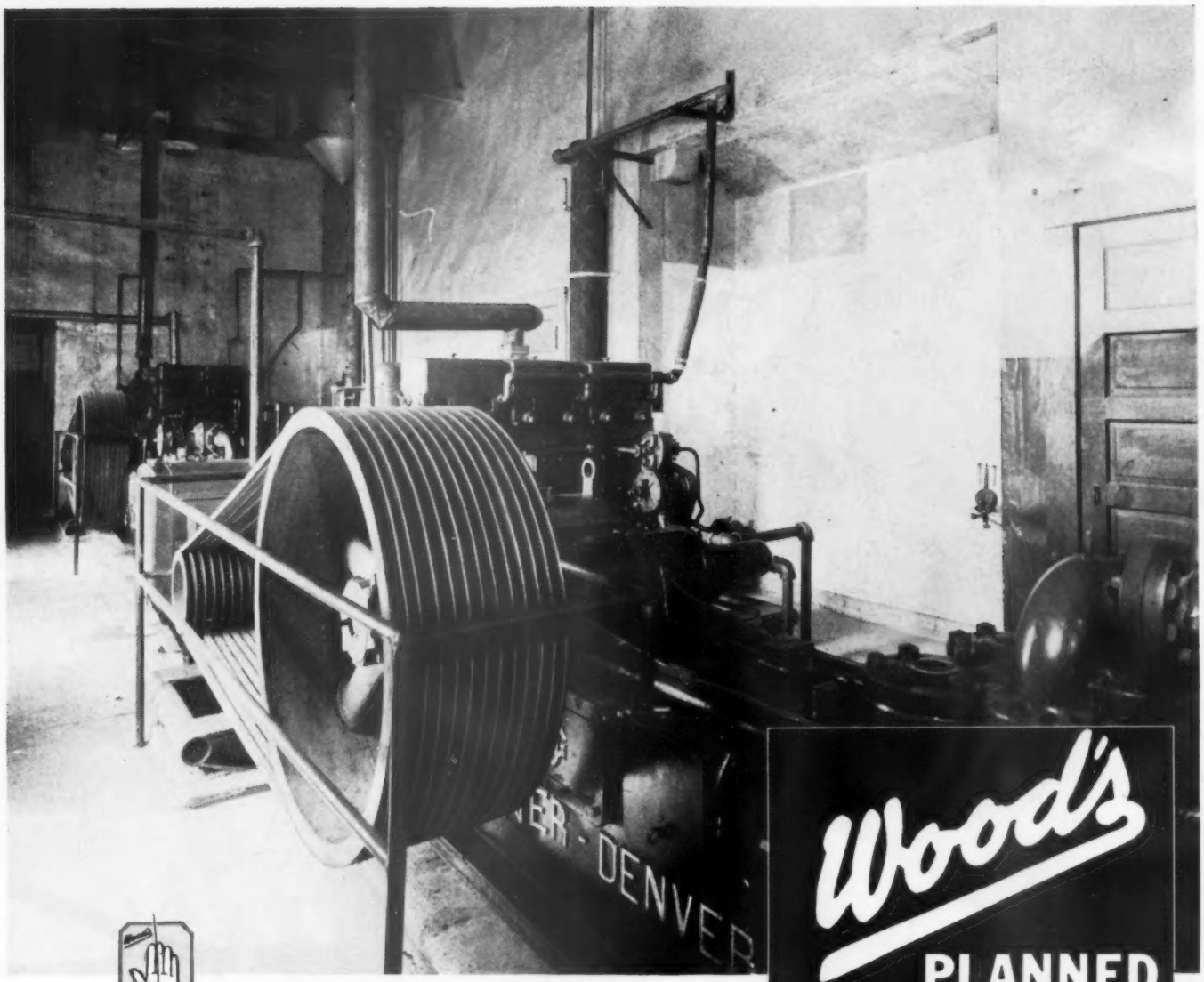
Write for Bulletin ID-105

INDUSTRIAL DIVISION

CONTINENTAL GIN COMPANY

BIRMINGHAM, ALABAMA

CGC ATLANTA • DALLAS • MEMPHIS CGC



FOR SALE
...RESULTS

Good appearance may make a sale, but it takes inherent quality and reliable performance to *keep a thing sold.*

For 87 years Wood's have served American industry faithfully and well. Today the *results* of our pioneering experience are available to you in dependable, efficient, power transmission equipment, which delivers the highest satisfaction and lowers operating costs.

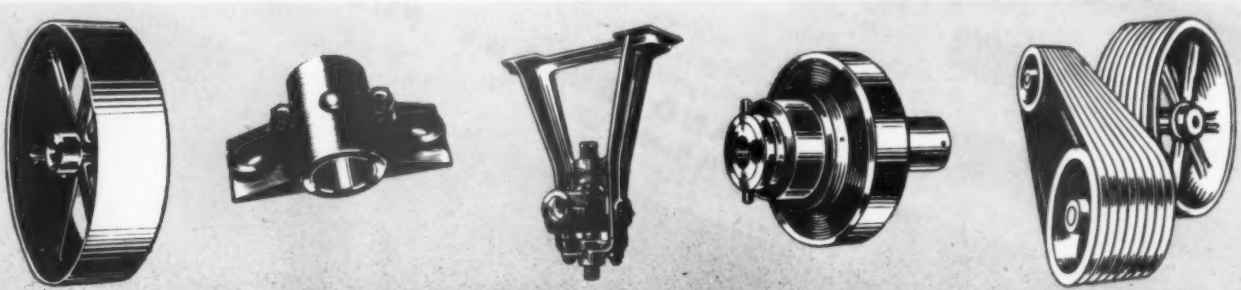
Specify Wood's planned power transmission for direct drives, modern group drives or V-Belt drives in *your* plant.

Write to us or see your local Wood's dealer for detailed information . . . No obligation.

Wood's

PLANNED POWER TRANSMISSION

The Wood's line of equipment for power transmission comprises bearings, collars, couplings, friction clutches, hangers, pillow blocks, pulleys and shafting for a variety of uses covering various industries, including cement mills, generators; paper mill, wood working and laundry machinery; compressors, mine fans, drill presses and for many other uses.



T. B. WOOD'S SONS COMPANY, CHAMBERSBURG, PENNA.

BRANCHES: 387-391 ATLANTIC AVE., BOSTON, MASS. • 83 PLANE ST., NEWARK, N. J. • 425 FIRST AVE., PITTSBURGH, PA.

CATALOG YOUR POST-WAR PRODUCTS IN THE 1945 EDITION . . . FORMS CLOSE DECEMBER 1

Every indication points to an early cessation of hostilities in Europe, with the end of the Pacific phase of the war in sight some time soon. Construction programs already planned will be the first big post-war project. The nation's pits and quarries will be among the first to benefit . . . among the first to buy needed equipment. Pit and Quarry Handbook is their year 'round production and buying guide and the 1945 edition will be in big demand. Catalog your post-war products in this exclusive manual for these industries. Reach every prospect in over 6,000 plants, pits and quarries . . . get full coverage for the vital 12 months of 1945 in the new edition. *Reserve space now*—forms close December 1.

PIT AND QUARRY PUBLICATIONS
538 SOUTH CLARK ST. CHICAGO 5

BIG DEMAND MAY MAKE POST-WAR DIESELS SCARCE!
ORDER YOURS NOW! USE

Sheppard DIESEL Post-Priority Plan...

One installation demonstrating Sheppard Diesel economy and dependability was described in this advertisement—appearing in the July 3 issue of this magazine.

WHEN THIS WAR ENDS, industry will need Diesels · · · plenty of them . . . as promptly as they can be obtained. But this very need for Diesels may make them hard to get.

Protect yourself! Order your Diesels now . . . through the Sheppard Post-Priority Plan.

No Guessing About the Future . . . No Involved Procedure

The operation of the Sheppard Plan is simplicity itself. You're not asked to guess the future. There's no involved ordering procedure.

You simply fill in the coupon at right stating your estimated Diesel needs. Sheppard engineers will make a recommendation suited to your requirements. This recommendation will be accompanied by a post-priority tentative order blank.

Once this order blank is returned, your name is placed on a special preference list. Names on this list will be given first claim on post-war Sheppard Diesels.

As soon as it is possible to place your order in production, Sheppard will notify you *of delivery date. Ten days after receipt of this notice,* your tentative order becomes binding.

Using the Sheppard Post-Priority Plan is simply thinking ahead to safeguard your future. Why risk being unable to obtain Diesels at a time when you may need them critically? Write today for your tentative order blank.

IT COSTS ONLY A PENNY NOW TO BE SURE OF A DIESEL LATER

PASTE COUPON ON POSTCARD

R. H. SHEPPARD COMPANY
107 MIDDLE STREET, HANOVER, PA.

Please have your engineers submit a recommendation for my power needs as specified below. I understand there is no obligation for this recommendation. Also enclose a Post-Priority tentative order blank.

H.P. Diesel required for _____

Remarks _____

_____

(IF ABOVE SPACE IS NOT AMPLE, PASTE COUPON ON LETTERHEAD.)

Company _____

Address _____

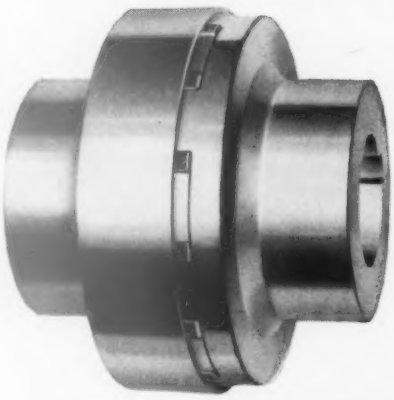
_____

By _____ Title _____

Sheppard ALL AMERICAN DIESELS

Another Coupling IMPROVEMENT by LOVEJOY

NEW TYPE "C"



New TYPE "C" Shrouded Flexible Coupling

Services 2.20 to 170 h.p. at 100 r.p.m. Pat. & Pats. Pend.

L-R FLEXIBLE COUPLINGS

ADDED PROTECTION

NEW DESIGN with extension of outside steel collar over heads of bolts, safeguards materials and fingers. Boltheads are concealed, yet readily accessible. This covering also effects new overall smoothness, reducing resistance, even airflow. Other L-R superiorities: Free-floating resilient load cushions hung between rugged jaws, free to deform to every emergency—cushions always in sight. No shutdowns for changing—more efficient correction of misalignment and absorption of shock and vibration. *Quiet.*

L-R *Better* Couplings for Every Service

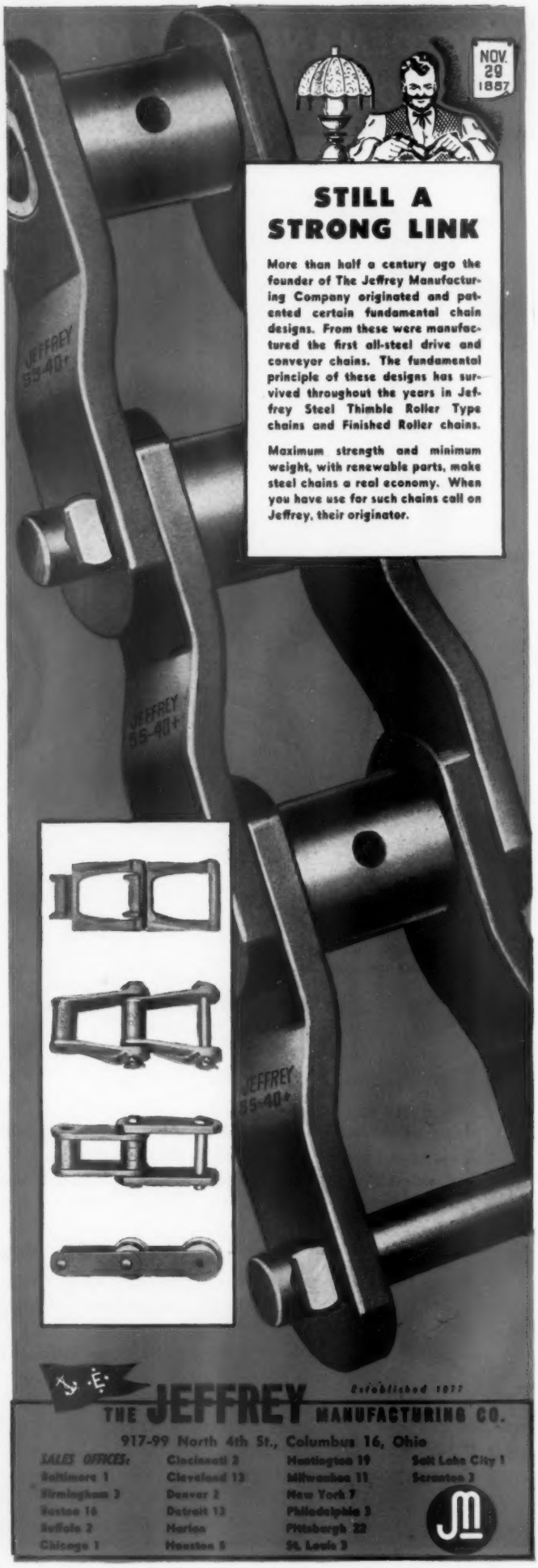
Non-Lubricated. Free of internal friction—require practically no attention. Couplings for every duty and condition 1/6 to 2500 h.p.

Send for Catalog and Free Selector Charts

Charts put your finger on couplings you require. Engineering data, weights, prices, right at hand. Special couplings engineered. Write or wire

LOVEJOY FLEXIBLE COUPLING CO.

5017 W. LAKE STREET, CHICAGO 44, ILLINOIS



STILL A STRONG LINK

More than half a century ago the founder of The Jeffrey Manufacturing Company originated and patented certain fundamental chain designs. From these were manufactured the first all-steel drive and conveyor chains. The fundamental principle of these designs has survived throughout the years in Jeffrey Steel Thimble Roller Type chains and Finished Roller chains.

Maximum strength and minimum weight, with renewable parts, make steel chains a real economy. When you have use for such chains call on Jeffrey, their originator.

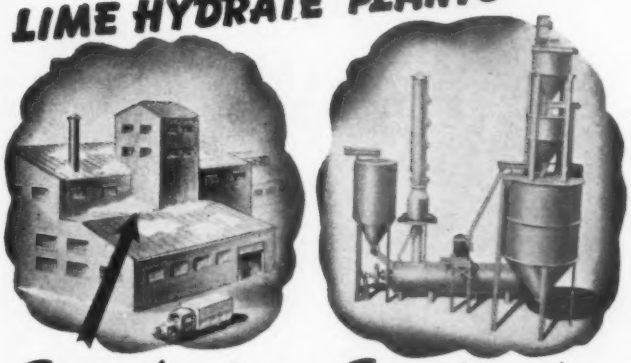
Established 1877

THE JEFFREY MANUFACTURING CO.

917-99 North 4th St., Columbus 16, Ohio

SALES OFFICES: Baltimore 1, Birmingham 3, Boston 16, Buffalo 2, Chicago 1, Cincinnati 2, Cleveland 13, Denver 2, Detroit 13, Marion, Houston 5, Huntington 19, Milwaukee 11, New York 7, Philadelphia 3, Pittsburgh 22, St. Louis 3, Salt Lake City 1, Scranton 2

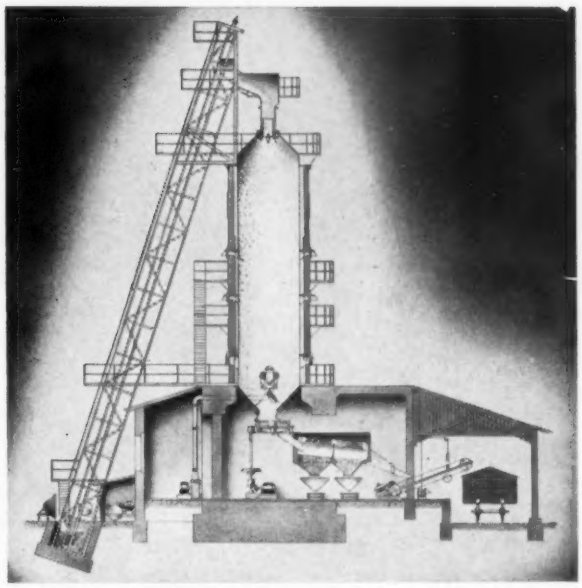
LIME HYDRATE PLANTS—



Stop that loss . . Save lime fines

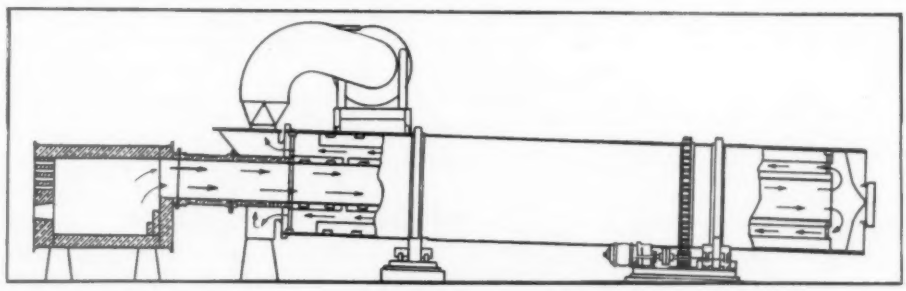
LIME Production for Profit

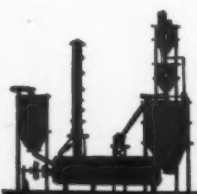
KUNTZ GRAVITY SYSTEM OF LIME HYDRATION — Provides absolute control of the hydration process in a single unit. Saves up to $1.50 per ton because patented dust control stops all loss of lime fines. Heat of hydration, often wasted, is used to heat water applied to hydrator. The only automatic system of one-man operation giving 100% control of quality and uniformity. Batch or continuous method. Can be applied to any type of hydrate plant.



YORK DOUBLE SHELL DRYER (Lower Right) — High thermal efficiency and the resulting economy of operation of the York Dryer is unsurpassed. Double shell allows hot gases to dry and pre-heat the stone by radiation. Gases absorb moisture in inner flue, completing the drying process. Result: high fuel efficiency with resultant fuel economy.

YORK-KUNTZ AUTOMATIC VERTICAL LIME KILN (Above)—Here's an automatic kiln that eliminates crushing and assures continuous control. Result: a uniform burn that reaches the absolute peak of fuel efficiency. Features: either mixed feed, coal or gas firing; continuous discharge and continuous feed; adjustable distribution; center load support; center combustion control.





OTHER McGANN PRODUCTS — LIME PLANTS COMPLETE - HYDRATORS - SHAFT KILNS - ROTARY KILNS - DRYING MACHINERY - TANKS - BINS - GREY IRON CASTINGS - SUGAR MACHINERY - SPECIAL MACHINERY FROM ENGINEER'S DESIGNS

LIME & HYDRATE PLANTS CO.

Associates McGANN MANUFACTURING COMPANY, *York, Pa.*

PIT AND QUARRY

SEPTEMBER, 1944

Vol. 37 No. 3

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MEMBER AUDIT BUREAU OF CIRCULATIONS

PIT AND QUARRY IS INDEXED IN THE ENGINEERING INDEX

Cross Country Haul!

THIS 240 mm. howitzer being hauled into position at the front will hurl a 360 lb. high explosive projectile more than 14 miles, with deadly accuracy and destructiveness.

Moving mobile artillery cross country means tough going for both gun and prime mover. And here, as on transport trucks and buses at home, proper lubrication is a matter of prime importance. Small wonder that more and more operators everywhere are turning to Texaco.

Texaco Marfak, for example, provides a tough, adhesive film that cushions chassis parts against road shocks and protects them against road splash. This unusual product provides ideal film lubrication inside a bearing, yet maintains its original consistency at the outer edges . . . sealing itself in, sealing out grit and water.

For wheel bearings, use *Texaco Marfak Heavy Duty.* It stays in the bearings — assuring safer braking. No seasonal change required.

So effective have Texaco lubricants proved that they are definitely preferred in many fields, a few of which are listed at the right.

Texaco Lubrication Engineering Service is available to you through more than 2300 Texaco distributing points in the 48 States. The Texas Company, 135 East 42nd Street, New York 17, N. Y.

THEY PREFER TEXACO

★ *More stationary Diesel horsepower in the U. S. is lubricated with Texaco than with any other brand.*

★ *More Diesel horsepower on streamlined trains in the U. S. is lubricated with Texaco than with all other brands combined.*

★ *More locomotives and railroad cars in the U. S. are lubricated with Texaco than with any other brand.*

★ *More revenue airline miles in the U. S. are flown with Texaco than with any other brand.*

★ *More buses, more bus lines and more bus-miles are lubricated with Texaco than with any other brand.*

TEXACO

TEXACO MARFAK

TUNE IN THE TEXACO STAR THEATRE EVERY SUNDAY NIGHT — CBS ★ HELP WIN THE WAR BY RETURNING EMPTY DRUMS PROMPTLY

EDITORIAL

Truck Tires and Repair Parts

FOR many months producers of nonmetallic minerals who depend on motor transportation have suffered, like the members of many other industries, from the serious shortage of truck tires and repair parts. They have been faced with the great problem of trying to make old equipment serve, a problem common to all production industries. In addition, while their need for replacements has grown at an accelerating rate—due to the retirement of equipment no longer usable and the consequent extra load placed upon that which remains partly serviceable—the number of tires and parts available for distribution has shrunken. Recently the situation has become so critical that not even the military forces have had the tires or parts they needed.

It is not pleasant, therefore, nor is it conducive to the maintenance of an even temper, to read in the newspapers about the production difficulties in the tire industry, for example. Man-power shortages have affected the production of tires as they have that of every other commodity, and to these have been added, as elsewhere, other problems that hamper rather than increase production. For a long time it has been reported in the press, and given added dissemination by repetition and exaggeration, that these failures to produce the maximum output of which existing plants are capable have been due to restrictions on the output capacity of individual workers imposed by workers' organizations. It has also been charged that management bears the responsibility for insufficient production because of its failure to provide suitable incentives to maximum output. The situation reached such a critical stage that the War Manpower Commission inaugurated a study of conditions and spent some ten weeks in an investigation of production schedules, restrictions on output, oversights on the part of management, and so on.

Restrictions on output have for decades been one of the implements used by labor unions. They were designed and adopted in the beginning to draw out the work and so prevent sudden termination of the job and resulting unemployment. Workers who showed an ability to produce more than what was believed to be a normal day's output for a normal worker were exposed to coercion, intimidation and physical violence for doing what was called "killing the job." This attitude harmonized with that shown toward strike breakers, in that it revealed a belief that the worker has a vested interest in his job. Irregularity of employment, the fear of being unemployed, the need of daily earnings to meet daily living expenses were the principal facts underlying the adoption and continued practice of what employers called "loafing on the job." Even in these days, when steady employment is more common, there is the realization, on the part of workers as well as employers, that this work will be but temporary and that it will end with cancellation of the war orders that have made it possible, and the resulting fear that termination of their employment may come any day without warning. It is necessary to take notice of these underlying factors if one is to understand and properly evaluate the carrying over into a period of war emergency of a principle which, however justifiable it may be in peace time, is an ugly thing under present conditions.

The same type of thinking and strategy found in the tire industry is common to other fields as well. In the automotive industry, on which producers in our field are dependent for truck repair parts, similar conditions prevail. Some of the restrictions on output are said to be "self-imposed" by the workers themselves, without instruction or advice from officials, indicating, if that is true, that limitation of output has become a rank-and-file strategy adopted by those whose fears of unemployment are personal and pressing.

In the tire industry the War Manpower Commission has reported as the result of the investigation mentioned that production could be increased 10 to 15 per cent. if management and labor could correct "certain deficiencies" which prevent the most effective use of the man power available. Among the reasons given for the failure of the factories to meet military demands was "an unanticipated heavy increase in the schedule for heavy-duty tires in the past seven weeks" due to changes in war strategy. The scarcity of "husky males" to work in the heavy-tire production schedules and lack of perfection in the use of synthetic materials in large-size tires were other reasons uncovered. These and other revelations led the War Manpower Commission to say in its report that "Publicity to date has overemphasized one or two factors, such as worker limits on productivity, as the reason for failure to meet production schedules, and has not presented the true picture."

In admitting that workers are not doing the most of which they are capable, union officials in the automotive industry have said that the companies are cutting back war production in various lines, laying men off, changing piece-work rates, speeding up production and otherwise getting ready for post-war production. The men see unemployment staring them in the face and their morale is said to be at a low ebb. Foundries and forge shops which make the castings and forgings for truck parts can not get the extra labor they need unless they raise wages, according to Victor Reuther of the United Automobile Workers.

LABOR-management committees are one of the means that may be helpful in studying and properly appraising the conditions that make possible situations like those prevailing in the tire and automotive industries, but other means should also be used. The interests of the ultimate consumer—truck owners in these cases—are never considered by the participants in controversies of this kind, yet these consumers should be consulted and they should be able to approach the problem without the stubbornness and bitterness that characterize the dealings between the representatives of management and workers in particular disputes.

POINTS YOU HAVE ASKED ABOUT AIR COMPRESSORS ... BEFORE GETTING A SCHRAMM

DURABILITY?

A big point. Schramm Air Compressors are rugged ... suitable alike for rough, rocky travel and for soft muddy places ... withstand wear and tear.

VERSATILITY?

Versatile—yes! Power and Engineering Companies use Schramm for laying conduits and cables ... digging post-holes ... operating pneumatic drills and hammers ... breaking pavements ... supplying hoist, lifts, jacks ... cleaning engines and machines by jets ... plus many more uses.

COOLING SYSTEM?

Ah, there's a feature! 100% watercooled, Schramm Compressors prevent overheating in summer, freezing in winter ... enabling them to work with doors closed (thus keeping out dust).

Schramm Air Compressors—both portable and stationary—are extensively used in general field service, generating stations, steam plants, repair shops.

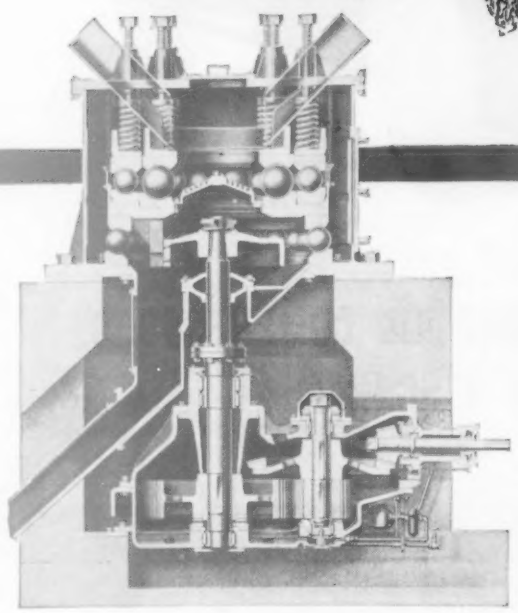
Outstanding features responsible for this widespread use are: completely watercooled ... mechanical cam-operated intake valves ... larger discharge in head ... forced feed lubrication, to every moving part, through oil lines drilled in metal ... main bearings for each cylinder ... vibrationless ... safe, fast starting by push button ... compact and lightweight!

Get air when you want it by using a Schramm. For further details write for Booklet Pub-44.

SCHRAMM INC.

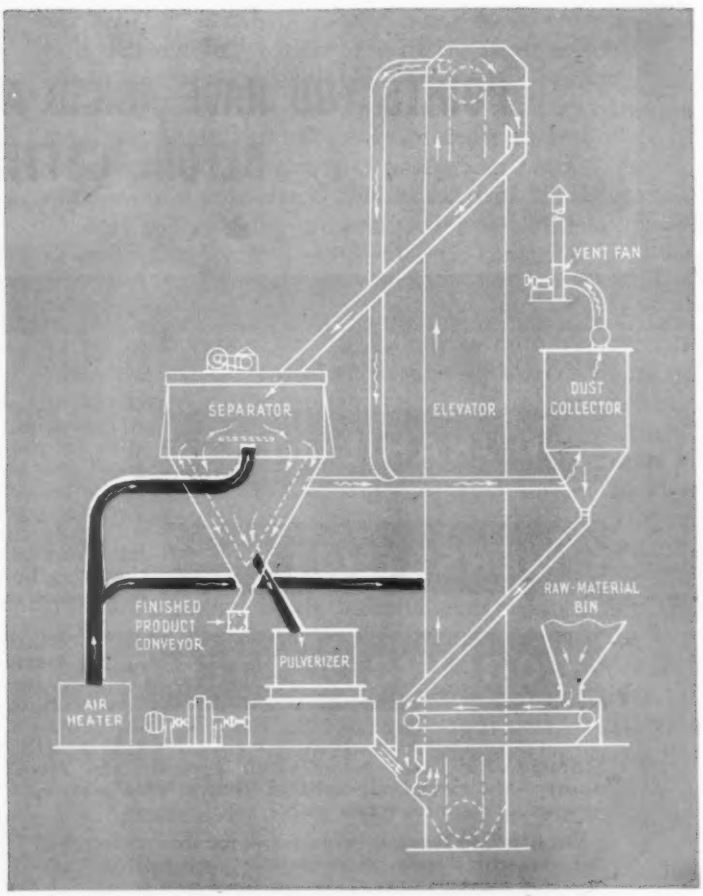
THE COMPRESSOR PEOPLE
WEST CHESTER
PENNSYLVANIA

DRYING AND GRINDING in ONE operation...with the B&W Closed-Circuit System



- Eliminates separate drying equipment
- Reduces cost of kiln feed
- Substantial circulating load assures a well-blended product

THE BALL-BEARING PRINCIPLE OF GRINDING MAKES THESE ADVANTAGES POSSIBLE



THE BABCOCK & WILCOX CO.

85 LIBERTY STREET, NEW YORK 6, N. Y.

C-58

PIT AND QUARRY

CHICAGO SEPTEMBER, 1944

Downward Trend in Building Activity Halted, WPB Says

Construction activity in the United States during the first half of this year showed the first break in the long monthly series of decreases in evidence since August, 1942, the War Production Board has disclosed.

The slight upturn of approximately three per cent., which began in April, was due to mild seasonal increases in private construction as public construction continued its long decline, it was reported. While it is expected that this trend will continue through the early summer, seasonal factors and decreases in public construction will cause the downtrend to be resumed in the fall, the W.P.B. said.

Total new construction activity during the first half of 1944 amounted to $1,874,000,000, a decline of 58 per cent. from the first half of 1943 and 40 per cent. from the second half of 1943. This was due primarily to decreases of 70 per cent. and 50 per cent. respectively, in public construction as private construction fell off only four per cent. and 11 per cent. over the same time period.

For 1944 as a whole, total construction activity is expected to be only approximately $3,550,000,000, or 54 per cent. less than in 1943. The steepest decline is expected to fall in public construction activity with a drop of 65 per cent. from 1943.

Henry J. Kaiser Takes Over Standard Gypsum

Henry J. Kaiser has taken over the lease and operation of the $20,000,000 Standard Gypsum Company, according to a recent announcement by Sydney A. Perkins, Standard Gypsum's 80-year-old president. Mr. Perkins revealed that he was turning over the company's plant at Long Beach, California, and its gypsum deposits in Nevada, Alaska and on San Marcos Island in the Gulf of California to the Kaiser Company on a 50-50 partnership arrangement involving future expenditures of millions of dollars of privately financed capital.

It is understood that Standard Gypsum Company will build new plants in the San Francisco Bay area and in Seattle under the Kaiser management.

Coming Events

September 27-29, 1944—Boston. Meeting, Industrial Minerals Division, American Institute of Mining and Metallurgical Engineers, Statler Hotel.

October 19-20, 1944 — Los Angeles. Joint meeting, Petroleum Division and Industrial-Minerals Division, American Institute of Mining and Metallurgical Engineers.

November 27 - December 2, 1945—New York. Exposition of Power and Mechanical Engineering, Madison Square Garden.

January 23-25, 1945—New York. 29th annual convention, National Sand and Gravel Association, Hotel New Yorker.

January 24-26, 1945—New York. 15th annual convention, National Ready Mixed Concrete Association, Hotel New Yorker.

January 29-31, 1945—New York. 28th annual convention, National Crushed Stone Association, Hotel New Yorker.

Cement Plant May Use Lignite for Firing Its Kilns

The South Dakota State Cement Commission is considering the conversion from gas to coal on the kilns at the state-owned cement plant at Rapid City. The proposed conversion would take place some time early next year. Studies are being made as to the possibility of utilizing lignite instead of higher-grade coal as fuel. Huge tonnages of lignite are mined in the Dakotas, more than in the rest of the states combined.

Management of the Rapid City plant was recently placed in the hands of Frank Gardner following the partial retirement of William Fowden who had been manager for 20 years. Mr. Fowden will continue to serve in the capacity of engineering consultant. Mr. Gardner went to Rapid City in 1924, along with Mr. Fowden, when the plant was completed. Both had previously been associated in the operation of the Hermitage plant at Nashville, Tennessee, and the National plant at Ragland, Alabama.

Crago Named Manager of Phosphate Plants

The American Cyanamid Company announces the appointment of Arthur Crago as manager of its phosphate - rock - production operations. Mr. Crago will be in charge of, and will have full responsibility for all of the company's activities in the Florida phosphate-rock field.

Previously he was manager, Phosphate Recovery Corporation, Mulberry, Florida; manager, Phosphate Mining Company, Nichols, Florida; assistant superintendent, U. S. Phosphoric Products Division of the Tennessee Corporation at Tampa, Florida.

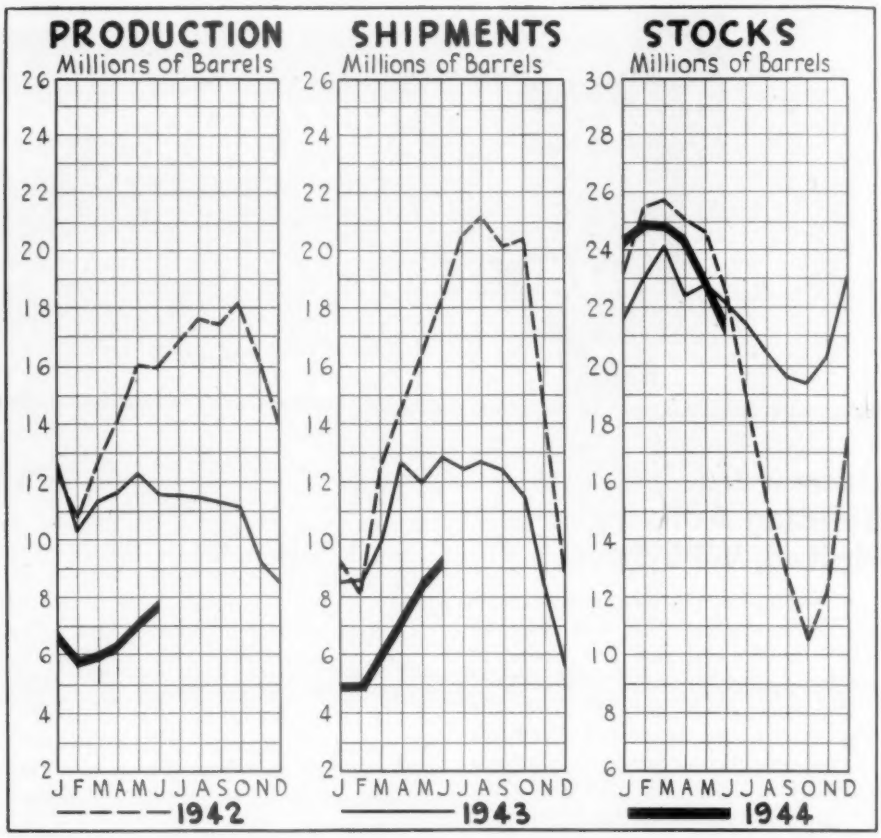
Sudden Heart Attack Claims J. W. Kennedy

J. W. Kennedy

The unexpected death of John W. Kennedy after a sudden heart attack Saturday, July 29, is a great loss to his many friends in the cement and concrete industry. Funeral services were held at Gesu Church, Detroit, with burial at Holy Sepulchre. Mr. Kennedy's death followed within seven months his appointment as general sales manager of the Huron Portland Cement Company to succeed A. J. Rooney who died on December 11, 1943.

Mr. Kennedy attended the University of Michigan where he received his M.S.E. degree in June, 1922. He was on the University faculty and staff of the Michigan State Highway Department from 1921 to 1925 when he left his position as acting director of the state highway laboratory to become administrative assistant for the Portland Cement Association from March, 1925 to July, 1926. He then went with the Huron Portland Cement Company and organized the Technical Service Bureau of which he was director until his appointment as assistant sales manager in 1942.

Mr. Kennedy was a member of the American Society of Civil Engineers, American Society for Testing Materials, American Concrete Institute, Engineering Society of Detroit (Michigan Engineering Society, Detroit Athletic Club and the Sigma XI, Phi Lambda Epsilon and Tau Beta Pi honorary engineering and scientific societies. He served as a member of the Portland Cement Association Technical Problems Committee for the years 1938 through 1943.



The Portland-cement industry in June, 1944 produced 7,906,000 barrels, shipped 9,350,000 barrels and had in stock at the end of the month 21,011,000 barrels of cement, according to the Bureau of Mines. About 40 per cent. of the existing manufacturing capacity was in use during the month. Compared with June, 1943, production was down 34 per cent., shipments were 26 per cent. lower, and stocks on hand were 5 per cent. below last year's level.

Nevada Talc Firm Will Tunnel Into Deposit

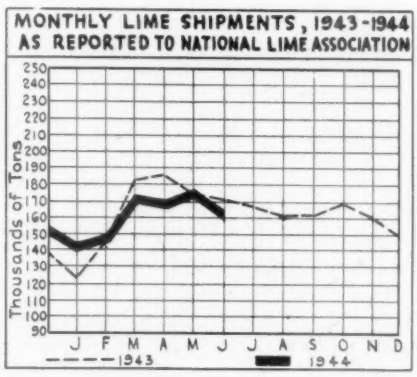
Operating talc properties at Talcton, near Palmetto, Nevada, the Sierra Talc Company is planning to drive a 1000-foot tunnel 700 feet below the crest of the ridge where mining is conducted on an outcrop of the deposit. The tunnel will enable the company to explore the deposit at depth, will be used as the main working outlet, and is expected to materially lower production costs.

Talc is mined at present from surface workings. Trucks are hauled up the steep slope for loading by a 25-horsepower gasoline engine. The company plans to extract talc through the tunnel when it has been completed, and hopes to locate higher grade material at depth.

Roscoe C. Wright and Sheriff W. D. Howard of Boldfield are shipping talc at the rate of a carload per week from their Bone Spring property in the Sylvania district. Material is said to be high quality and is sent to the Muroc Clay Company of Los Angeles. Mr. Wright reports he recently located a high-grade talc deposit on the adjoining Big Four claims. Croppings are said to range from 4 to 5 feet wide and have been traced about 600 feet.

Mr. Wright is known in mining circles of southern Nevada as "Death Valley Curley."

The Yosemite Portland Cement Company, Merced, California, has terminated its operations permanently, according to a notice sent to all stockholders by the company directors. The plant has been sold to the Henry J. Kaiser Company, which will resell the equipment to a manufacturer in Venezuela.



According to data collected by the National Lime Association, 56 companies in June, 1944, shipped 159,289 tons of lime (96,967 quicklime; 62,322 hydrate). Reporting companies represent 42.6 per cent. of the association's total capacity of record. Based on PIT AND QUARRY'S estimates for the remainder of the industry, the total shipments for the month by all plants were approximately 400,000 tons. Shipments of lime by users for June, 1944, were:

Use	Quicklime (tons)	Hydrate (tons)
Agricultural	1,645	21,046
Building	7,569	18,324
Chemical	87,753	22,952
Total	96,967	62,322

Mica-Trimming Plant Opened in Elko, Nevada

A mica-trimming plant has been placed in operation in Elko, Nevada, by the Strategic Minerals Company of California. More than 50 persons, chiefly women and youths, are employed under supervision of Vernon Farnam, general manager.

Mica is brought to the plant from deposits in the Ruby Mountains, acquired three years ago by the company. The material is trimmed, flaws removed, and shavings ground for various insulation purposes. The management reports the product is worth $6 per pound.

Four claims covering a deposit of muscovite, the common type of mica, were located recently 30 miles west of Lovelock by Walter Fitzgerald, Paul G. Reed and Ira Stanley. Material is found in a large pegmatite dike, prospecting indicates the deposit is extensive, and the locators report they will seek a Federal loan to finance development work.

May Forbid Tank Cars from Hauling Asphalt

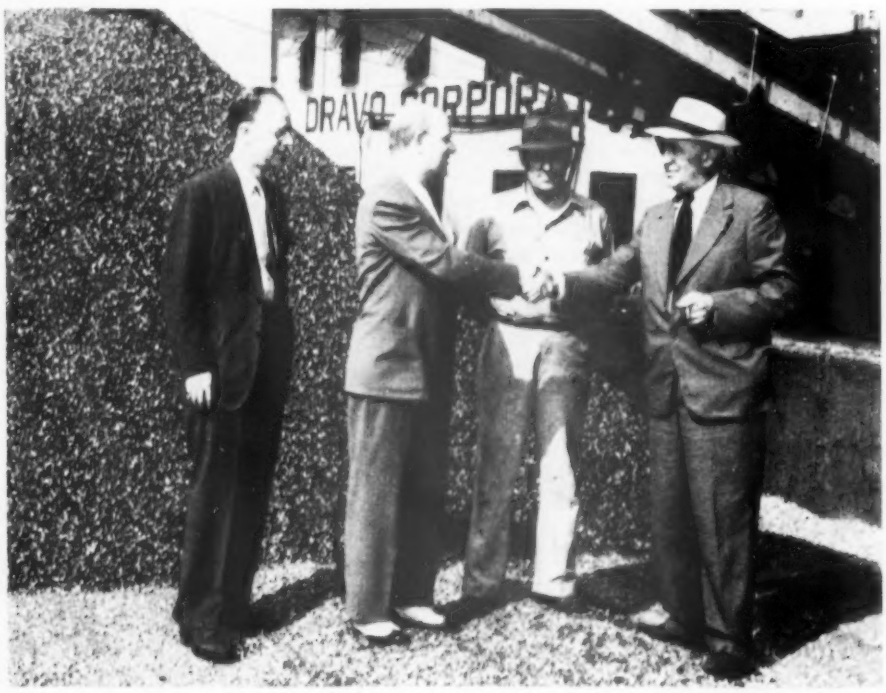
During a conference held recently between officials of the Petroleum Administration for War and E. W. Bauman, field engineer National Crushed Stone Association, it developed that the O.D.T. is seriously considering the withdrawal of all or a major portion of the tank cars now assigned to the railroads for use in transporting asphaltic materials. The rapidly increasing demand by the military for gasoline and allied products will undoubtedly require that such action be taken.

Phillips to Direct Disposal of Surplus

Ed. Phillips, well-known construction-equipment engineer who was president of the Associated Equipment Distributors Association in 1943, as well as vice-president of American Road Builders Association, has been appointed director of the Construction Machinery and Farm Equipment section of Treasury's Surplus Property Division.

Mr. Phillips is from Richmond, Virginia, a senior partner in the firm of Phillips Machinery Company, with offices in Richmond and Washington.

An Idaho farmer-industrialist, Jack Simplot of Caldwell, is building a plant in southeast Idaho to convert phosphate rock into fertilizer for sale to farmers of the northwest. The plant will cost close to half a million dollars.



Harry H. Brainerd, executive manager of the Western Pennsylvania Safety Council, congratulates A. J. Hippert, general superintendent in charge of the Keystone Sand & Gravel Company operations, for the outstanding safety record which his men accomplished during the year 1943. Keystone, a division of the Dravo Corporation, Pittsburgh, recently took first place in the 15th annual safety contest sponsored by the U. S. Bureau of Mines and the National Sand & Gravel Association. Included in the picture are Gerard Griffin, Safety Director of the Dravo Corporation; Harry H. Brainerd; L. C. Laymon, Captain of Keystone's Dredge No. 9, and A. J. Hippert.

National Gypsum Earnings Higher Than Last Year

The net earnings of National Gypsum Company and subsidiary for the first six months of 1944 ended June 30, amounted to $494,770 after provision for taxes, equal to 26 cents per share of common stock, Melvin H. Baker, president, has announced. This compares with $442,658, or 22 cents a common share, for the first half of 1943.

Mr. Baker said that sales for the period were up 14 per cent. The six months' sales amounted to $12,066,979, against $10,585,292 for the like period of last year.

Second quarter net earnings amounted to $260,882 as compared with $263,375 for the same period in 1943, while this year's second quarter sales totaled $6,338,783 against $5,797,063 in the second quarter of 1943.

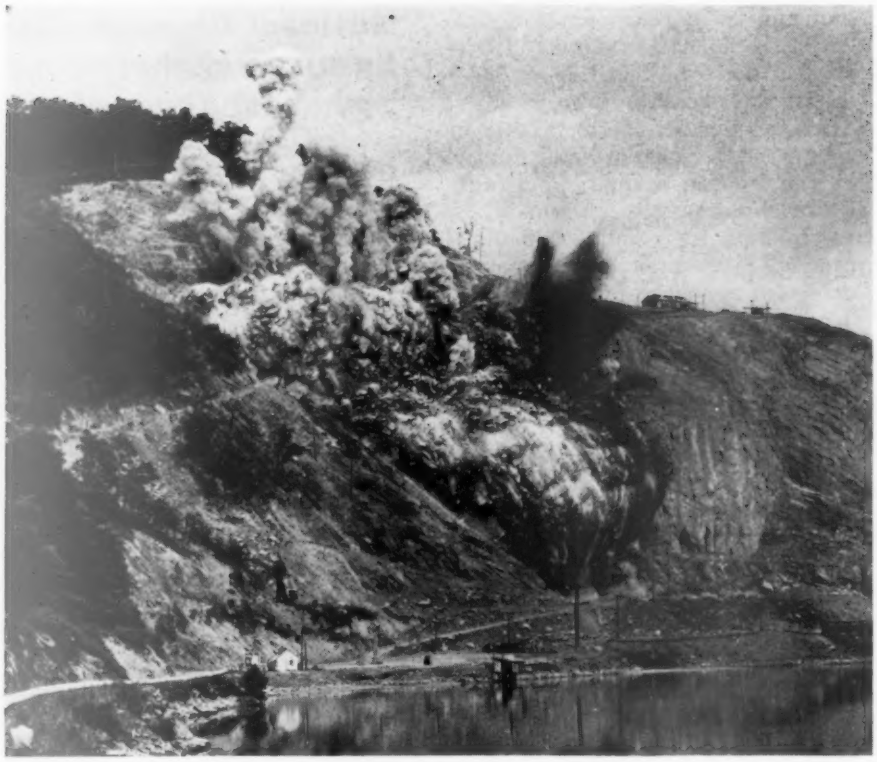
The report, which has been mailed to stockholders pointed out that the development of sales to other industries has enabled the company to maintain large sales volume in the face of continuous decrease in the demand for building materials.

Carney Appoints Holmer General Sales Manager

N. A. Holmer

N. A. Holmer, formerly director of sales and marketing for the Elastic Stop Nut Corporation of Newark, New Jersey, is now general sales manager of the Carney Cement Company and the Carney Rockwool Company, with quarries and plants at Mankato, Minnesota. Mr. Holmer and the Carney sales staff will move to the company's St. Paul offices from Mankato in order to provide greater service to the building industry.

Mr. Holmer was formerly general sales manager of the Mid-State Steel & Wire Company of Crawfordsville, Indiana, distributing farm steel products to a national market. Previously he headed sales for Unity Mills Distributing Company, a concern distributing steel products and building materials to the Northwest market.



Pictured above is a record blast made at the quarry operated in connection with the concrete-mixing plant for the Tennessee Valley Authority's nearly-completed dam at Fontana, North Carolina. T. V. A. engineers claim it is the largest shot ever fired on a construction job. Approximately 600,000 tons of rock was brought down by a charge of 208,700 pounds of du Pont Nitramon. Ensign-Bickford primacord was used for detonating. A total of 51 nine-inch blast holes were drilled, of which 27 were 236 feet deep and 24 were 150 feet deep.

Revive Asbestos Mining at California Deposit

Development work has been undertaken on an asbestos deposit at the old Bowman mine six miles west of Forest Hill, California, acquired recently by the Gold Meadows Mining & Milling Company. Two tons of long fiber asbestos have been shipped from surface workings, and prospects are said encouraging for development of commercial material at further depth.

Dr. John W. Ross is president and general manager of the company. Frederick E. Browne, Auburn mining engineer, has been engaged by the corporation as consulting engineer. The Bowman property was worked for its placer gold more than 85 years ago.

Mexican Production of Cement Increases

Since its creation in May, 1943, the United States-Mexican Commission for Economic Co-operation has studied ways and means of increasing the production of Portland cement in Mexico. Production of this important construction material has never been adequate for the country's needs, and each year large quantities have been imported from the United States. In 1941 imports amounted to 46,000 barrels.

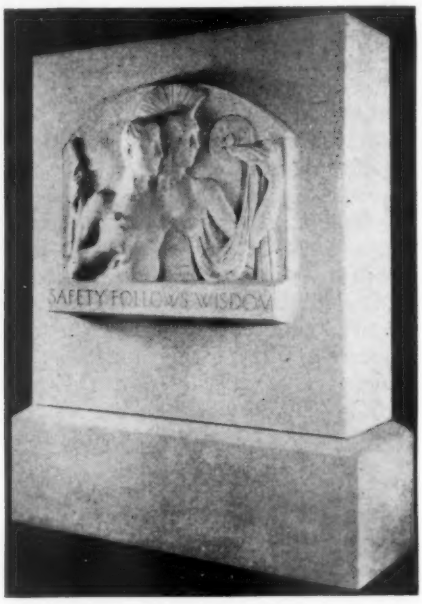
The commission has recently announced a nationwide development program for the Portland cement industry in Mexico that will eventually increase production to more than 1500 tons per day. The present capacity of existing plants is about 850 tons per day. The plan creates 5 zones: northwest, north, central, gulf and south, and the intention is that each zone shall eventually produce its own requirements.

In the northwest zone a new plant with a capacity of 110 tons per day is already under construction at Mazatlan. The plant at Monterrey in the north zone will be enlarged. A new factory of 450 tons daily capacity will be built at Leon and small plants will be built at Cuernavaca, Jasso and Apasco in the central zone. In the gulf zone the Orizaba plant will be enlarged to 200 tons daily capacity, and a plant will be constructed in Merida, Yucatan, to supply 100 to 150 tons per day. No cement capacity exists in the south zone at present, and a small plant will be built on the Inter-Ocean Railroad at Lagunas.

It is expected that the increased production will substantially reduce cement costs throughout the country, and that the new plants will employ about 700 workers.

Huron's Alpena Plant Awarded Safety Trophy

The Huron Portland Cement Company, Alpena mill has been awarded the Portland Cement Association Safety Trophy in recognition of having operated during the calendar year 1943 without a lost-time accident. This trophy consists of a four-ton concrete monument which will be located permanently near the entrance to the mill.



The P. C. A. safety trophy.

The trophy was presented to the company with ceremonies held at the Alpena County Fair Grounds on July 22. The distributing plant superintendent played an important part in the safety ceremonies because of the fact that all ten distributing plants have been operated for five and a half consecutive years without a single accident.

Michigan Surveys Gypsum Resources

The geological survey division of the Michigan state department of conservation is undertaking a survey of the state's gypsum deposits, according to an announcement by R. A. Smith, state geologist. It is anticipated that after the war there will be an increased demand for Michigan gypsum in the manufacture of wall and plaster board, insulating materials and cement.

The field survey will cover mines and quarries in the Grand Rapids area and gypsum deposits in Arenac and Iosco counties.

Plant Reconversion

WITH the news from the war fronts uniformly good, economic developments at home draw more and more upon the interest and attention of the general, as well as industrial, public. It was in belated recognition of this increasingly evident attitude that the first business taken up by the reconvened Congress was controversial legislation in the field of reconversion.

The heated debates which have ensued over such problems as federal versus state control of unemployment-compensation payments, the amount and coverage of such payments, and the setting up of standards under which surplus commodities are to be disposed of, have tended to obscure a much more fundamental issue—the provision of adequate governmental machinery by means of which to cushion and smooth transition difficulties in the economy. Even with the imminence of a sudden conclusion to hostilities in Europe, the Congress is still playing politics with the most critical economic problems the country faces, as is apparent from the division in it along strictly political lines on every reconversion question which has been raised at this session.

The implications of such an approach to these problems are a little appalling. The reconversion question goes far beyond a matter of mere physical change-over of some plants from the production of war goods to the production of civilian goods. Every group, every industry, every enterprise in the United States has a vital stake in the organization and direction of the nation's economy. What is happening on the floor of the Congress at the present time will have the most profound effects upon that economy and will very largely lay the seeds for prosperity or disaster in the future. No group, if only for its own self-interest, can afford to be disinterested in the legislation now being debated in the Congress. Some groups, perhaps some entire industries, look forward to the transition and post-war periods with equanimity, if not complete optimism, on the theory that conditions peculiar to their industries point inevitably to a continuation of happy times. Whatever these conditions in whatever industries, nothing could be further from the truth.

This war has proved the difficulty of achieving full production and full employment. No one would argue that war is desirable because it can bring about this desirable end. Yet we have never been able to achieve that end without war. As a result of our economic mobilization for war the economy is now geared up to a level which need only be maintained in order to continue to reap the benefits of full employment. It is obvious that it will be easier to maintain a high level of economic activity than to have to raise the level of activity after allowing it to fall off. If the proper machinery were provided to maintain that high level, the economic outlook of the nation would be considerably improved.

If, on the other hand, no such machinery, or inadequate machinery, is provided, we may anticipate a situation closely resembling economic chaos immediately following the termination of the war in Europe. Large-scale cancellation of contracts for war goods no longer needed would be followed by large-scale release of labor from the munitions industries, with no compensating increase in civilian output to absorb such unemployment. It is wishful thinking to expect individuals, whose incomes have been curtailed, or are in danger of being curtailed, to spend their savings freely. Such a reaction would be contrary to all human nature. The net resultant of all the forces at work would therefore lead to a serious reduction in the volume of economic activity, the remedy for which would require considerable time and a series of painful treatments. It is becoming increasingly clear to many Washington observers that the Congress is on the wrong track in failing to see this situation in its full implications.

Effective legislation is not the only requirement for a prosperous economy. The considerable authority already vested in the hands of existing government agencies can also be exercised wisely or unwisely. After the most violent opposition, and several internal disputes culminating in the resignation of Executive Vice-Chairman Charles E. Wilson, the War Production Board has succeeded in establishing the beginnings of a reconversion program. To a large extent this is still a program in name only. Nevertheless, it is now firmly established on the books, as are the mechanics for carrying it out. The withdrawal of Mr. Wilson is interpreted as the final victory for Mr. Nelson, who has been growing steadily in public and congressional esteem for several months. If Mr. Nelson stays on as W.P.B. chief when he returns from his mission to China, it will be only with the clear understanding that he will have a free hand in directing reconversion activities. This should place him in the strongest position he has occupied since he delegated most of the authority for war production to the Army, Navy and Maritime Commission early in 1942, and should clear the way for effective performance of the reconversion job.

Brucite Being Shipped to Maple Grove Plant

Mining large brucite deposits in the Gabbs Valley section of the Mammoth district, Basic Refractories, Inc., is reported shipping about 6,600 tons of the product monthly to its plant in Maple Grove, Ohio. C. E. Schwab is general manager. Ore is mined by the open-pit method and delivered to the crushing plant under contract by the Morrison-Knudsen Company.

Herbert Reynold of Basic Refractories has reported that testing carried on by the company has shown the "sink-float" process is definitely adaptable for treatment of the brucite. Waste dikes can be separated from the brucite by using magnesite as the heavy medium.

The company is reported considering construction of a calcining plant to remove most of the moisture from the brucite before it is shipped to Maple Grove. Approximately 30,000 tons of ore are excavated monthly but only the richer product is milled and shipped.

Brucite is used extensively for furnace lining, high quality firebrick and other purposes where adequate resistance of extreme heat is required. The deposits are located near magnesite properties operated by Basic Magnesium, Inc., and Sierra Magnesite Company.

the VICTORY *Program*

. . . . . AND YOUR BUSINESS

BAGS.—To assure an adequate supply of paper shipping sacks for packaging and for shipping certain essential products and materials, restrictions governing the manufacture and use of new sacks were promulgated August 8 by the Paper Division of the War Production Board through amendments to Limitation Order L-279.

Starting with the allocation of kraft pulp, manufacturers of paper intended for making shipping sack paper and producers of paper sacks from kraft pulp are required to use such pulp for no other purpose, Burton A. Ford, Chief of the Paper Shipping Sack Section of the Paper Division, said.

Amendments to the order also restrict the use of this type of paper for purposes other than those listed in Appendix A. That list includes many minerals and building materials, as well as various essential miscellaneous items, all of which are packaged for storage and shipment in paper shipping sacks.

Commercial consumers who used sacks made of shipping-sack paper prior to issuance date of the amended order (August 8), may continue to use them for such purposes for 45 days.

Other restrictions cover asphalted paper (asphalt laminated, impregnated, coated or infused with asphalt or asphalted compounds), paraffined and moisture-proof paper when used in paper shipping sacks. These materials are used to protect chemically reactive and hygroscopic (moisture-absorbing) materials.

The allowable items listed in Schedule B include a number of minerals, chemicals, foods and seeds, as well as insecticides, fungicides, disinfectants, germicides, asphalt and certain hygroscopic types of cements.

Exceptions in the use of sacks containing these moisture-proof sheets are made when shipments are intended for the Armed Services or foreign export, and for use by the Foreign Economic Administration when shipped empty to the armed forces, it was stated.

The following extracts from the order show only those portions that have been changed by the amendment of August 8:

§ 3281.91[1] *Limitation Order L-279*—(a) *Definitions.* For the purposes of this order:

(1) "Paper shipping sack" means any *new* single-wall, duplex, or multi-wall paper sack designed for use as (*a*) a primary container for packing a particular commodity for storage or shipment, (*b*) a container shipping sack for combining a number of packages of a particular commodity into a single shipping unit, or (*c*) an overslip-shipping sack for covering a single package of a particular commodity for shipment. This does not include the following: sacks designed as liners for outer containers, combination textile-paper bags (bags made of textile laminated with paper), grocers and variety bags (as defined in Order L-261), bags made wholly from cellophane, glassine, parchment, or waxed paper, or flat envelope types of containers made on envelope machines (such as lithographic seed envelopes).

Restrictions

(b) *Restrictions on manufacture and use*—(1) *Restrictions on use of pulp and on deliveries of shipping sack papers.* All pulp allocated on Form WPB-2973, Sub-Schedule D-2 Items 2054100 and 2054900 must be used only for the manufacture of shipping sack paper. No paper manufacturer shall deliver shipping sack paper if he knows or has reason to know that it will be used other than in the manufacture of paper shipping sacks. No sack manufacturer or commercial user may receive or use shipping sack paper for any purpose other than to manufacture paper shipping sacks. sack manufacturer shall manufacture any paper shipping sack made of shipping sack paper which does not conform to all applicable restrictions of each schedule of this order.

(3) *Restrictions on use.* No commercial user may use a paper shipping sack made of shipping sack paper for any other purpose than those listed on Appendix A. However, any commercial user who used paper shipping sacks made of shipping sack paper prior to August 8, 1944, to package any commodity not listed on Appendix A may continue to use them for such purpose for 45 days after August 8, 1944. The provisions of this paragraph shall not apply to paper shipping sacks used for delivery to the Army, Navy, Maritime Commission or War Shipping Administration, nor to the Foreign Economic Administration for empty shipping sacks when shipped to or for the Armed Forces of the United States.

Miscellaneous Provisions

(f) *Certification to the seller of paper shipping sacks by the buyer.* No commercial user may order or accept delivery of paper shipping sacks to a commercial user unless the buyer furnishes, or has previously furnished, to the person making delivery, certification in substantially the following form, signed manually or as provided in Priorities Regulation No. 7 (§ 944.27) by an official duly authorized for such purpose.

The undersigned certifies, subject to the penalty of section 35A of the U. S. Criminal Code, to the seller and to the War Production Board that he is familiar with the order L-279 and that all purchases by him of items regulated by that order, as amended from time to time, will be in compliance therewith.

The above certificate must be used and the certification provided for in Priorities Regulation Number 7 may not be used in its place and stead.

This is a one-time certification and need not accompany each individual order for paper shipping sacks.

NOTE: Paragraphs (g), (h), (i) and (j) formerly (f), (g), (h) and (i) redesignated Aug. 8, 1944.

SCHEDULE I

(e) *Permitted paper grades for Appendix B.* Asphalted paper (paper laminated, impregnated, coated or infused with asphaltic compounds), paraffined paper and moisture-proof paper may only be used for paper shipping sacks to package the items listed on Appendix B.

[1]Formerly Part 3270, § 3270.25.

The following extracts from Appendices A and B list those products of maximum interest to nonmetallic-mineral producers:

APPENDIX A

BUILDING MATERIALS

Cement bulk:
- Portland.
- High-early.
- White Portland.
- Oil-well.
- Insulating.
- Plastic.
- Waterproof.
- Masonry.

Glass wool, bulk, 25 pounds or more.
Gypsum, bulk, 2 pounds or more.
Masonry mortars, bulk, 25 pounds or more.
Mineral wool, bulk, 25 pounds or more.
Mortar mix, bulk, 25 pounds or more.
Plaster, bulk, 2 pounds or more.

CHEMICALS AND PIGMENTS

Basic slag.
Borax.
Calicum silicate.
Lime (hydrated).
Lime (quick).
Magnesium salts.
Pigments.
Potash salts.
Salt (sodium chloride).
Sodium salts.
Sulphur.
Whiting ($Ca\ CO_3$).

MINERALS

Abrasives, bulk, 25 pounds or more.
Alumite (alunite), bulk, 25 pounds or more.
Aplite rock, bulk, 25 pounds or more.
Asbestos, bulk, 25 pounds or more.
Asphalt filler, bulk, 25 pounds or more.
Barytes and other barium products, bulk, 25 pounds or more.
Bauxite, bulk, 25 pounds or more.
Cement, refractory, bulk, 25 pounds or more.
Cement, silica, bulk, 25 pounds or more.
Clay and talc, bulk, 25 pounds or more.
Cyanite (kyanite), bulk, 25 pounds or more.
Diatomaceous earth, bulk, 25 pounds or more.
Feldspar, bulk, 25 pounds or more.
Flint, bulk, 25 pounds or more.
Fluorspar, bulk, 25 pounds or more.
Graphite, bulk, 25 pounds or more.
Magnesite, bulk, 25 pounds or more.
Mica, bulk, 25 pounds or more.
Pumice, bulk, 25 pounds or more.
Pumicite, bulk, 25 pounds or more.
Pyrophyllite, bulk, 25 pounds or more.
Quartz, bulk, 25 pounds or more.
Roofing granules, bulk, 25 pounds or more.
Silica, bulk, 25 pounds or more.
Silica flour, bulk, 25 pounds or more.
Slate flour (dust or granules), bulk, 25 pounds or more.
Soapstone, bulk, 25 pounds or more.
Spar, bulk, 25 pounds or more.
Sprayed asbestos, bulk, 25 pounds or more.

APPENDIX B—ASPHALTED, PARAFFINED AND MOISTURE-PROOF PAPER

Cement (high-early, oil-well, white Portland, insulating, plastic, waterproof and refractory).
Fire clay.
Limestone, ground (used for mine dust only).
Salt (sodium chloride).

TRUCK TIRES.—Drastic curtailment of the use of heavy-duty truck tires is provided in an *Essentiality List of Truck and Bus Motor Vehicle Services* issued by the War Food Administration and the War Production Board on July 22. This list is to be used as a guide in the allocation of new replacement tires and was prepared by the agencies named at the request of the Office of Defense Transportation. The list, although long, is reprinted in full below, even though only a few of the services enumerated affect producers of nonmetallic minerals, because it will be of interest to them to compare their standing in the list with that of other industries. The producers of nonmetallic minerals fall in the classification Extractive Industries (Production, refining and distribution). Producers of agricultural limestone fall, according to information given to the National Crushed Stone Association, in Processing Industries (Manufacturers), subdivision 31a, Navy, military, industrial and agricultural chemicals, which carries a 2A rating compared with the Extractive Industries, subdivision Quarry Products, which carries only a 3 rating. They therefore have an advantage in priority status over those crushed-stone producers who do not also make agricultural limestone.

The official release follows:

WAR FOOD ADMINISTRATION—WAR PRODUCTION BOARD

July 22, 1944

ESSENTIALITY LIST OF TRUCK AND BUS MOTOR VEHICLE SERVICES

For the Determination of Priority and Preference Based on the Essentiality of Service in the Allocation of New Replacement Tires.

This Essentiality List has been prepared by the War Production Board and the War Food Administration at the request of the Office of Defense Transportation because of the severe shortage of the supply of truck and bus tires. The list provides a classification of motor truck services according to the CWN Code in terms of commodities carried and industries served. *All services are grouped into classes according to their relative essentiality. The priority ratings as listed apply to each size and type of tire for trucks and buses for which applications exceed supply.* The Priority List is designed to provide a flexible basis for determining eligibility as conditions vary from time to time and from place to place.

Preference based on essentiality is a determination which may be conditioned by: Conservation practices, urgency of the need for a tire, opportunity for diversion to other carriers and the availability and preference accorded by an assigned rating if:

1. Diversion of traffic to other carriers is feasible.
2. The character of operations, type of equipment, and condition of tires will permit recapping or use of lower grade tires.
3. There is another applicant within the same priority class who has a greater degree of urgency.

Essentiality List of Truck and Bus Motor Vehicles services

For the determination of priority and preference based on essentiality of service in the allocation of new replacement tires for commercial vehicles.

Essentiality shall be accorded in order of the Classes 1, 2A, 2B, 3, 4, 5. The order of listing within any class does not indicate priority. Services connected with the following:

Legend:

(O) Off-the-highway and over-the-road commercial operations.

(WS) Wholesale local commercial delivery and service operations.

(R) Retail local commercial delivery operations.[1]

	(Services)	O	WS	R
	GOVERNMENT AGENCIES			
02	Fire fighting	1	1	1
03	Policing	1	1	1
04	Public health, garbage and sanitation	1	1	1
06	Mail	1	1	1
09	Highway maintenance and repair	3*	3*	–
	Other Government services[2]	–	–	–
	PUBLIC UTILITIES			
80	Mixed service[2]	–	–	–
82	City and suburban bus lines	1	1	1
83	Intercity bus lines	1	–	–
84	Intercity truck lines (all commodity)	2A	2A	–
85	Intercity and local carriers of household goods	3	3	3
86	Intercity truck lines, agricultural products (all commodity)	2A	2A	–
87	Intercity truck lines (limited commodities)[2]	–	–	–
88	City trucking and drayage[2]	–	–	3
89	Tank trucking, city and intercity	1	1	–
90	Other mixed or not classifiable service[1]	–	–	–
91	Carriers other than motor carriers	2B	2B	–
92	Telephone, telegraph and radio (communication)	1	1	3
93	Other Public Utilities	1	1	–
	AGRICULTURAL AGENCIES			

In this group will be included the applications of persons, firms or corporations engaged in farming, dairying, animal husbandry, fishery, and forestry, not including, however, any logging or timber operations.

		O	WS	R
14	Ice	2A	2A	2A
20	Mixed and other farm products:			
20a	Perishable farm products	2A	2A	3
20b	Non-perishable farm products	2B	2B	3
21	Live animals:			
21a	Meat animals, work animals and bees	2A	2A	–
21b	Race horses, exhibition horses	5	5	–
22	Live poultry	2A	2A	3
23	Crude animal and poultry products, edible	2A	2A	2A
24	Crude animal products, inedible (except fibres):			
24a	Crude animal products, inedible hides and skins	2B	2B	–
24b	Shells	3	3	3
24c	Furs, feathers, etc., except for army orders	5	5	5
25	Fresh fruits and vegetables	2A	2A	3
26	Grain:			
26a	Grain except malt, hops and brewer's rice	3	2B	2B
26b	Grain malt, brewers' rice and hops	5	5	–
26c	Malt extract	2B	2B	3
27	Animal and poultry feed	2A	2A	3
28	Dried fruits and vegetables (except coffee and tea)	2B	2B	4
29	Animal and vegetable fibes.	3	3	5
46	Agriculture equipment	2B	2B	3
50	Other mixed processed necessaries[3]	–	–	–
51	Farm supplies	2B	2B	3
52	Dairy products—processed:			
52a	Dairy products except ice cream and frozen desserts	2A	2A	2A
52b	Ice cream and frozen desserts	4	4	5
		O	WS	R
53	Packing house products			
53a	Packing house products, perishable	2A	2A	3
53b	Packing house products, non-perishable	2B	2B	4
54	Processed foods and groceries except beverages:			
54a	Bread, and breads (except pastries), flour, meal and baking ingredients	2A	2A	2A
54b	Cake, cookies, crackers, pastries, etc.	4	4	4
54c	Other processed groceries except coffee, tea and extracts	2B	2B	4
54d	Coffee, tea, extracts	4	4	4
61	Alcoholic liquors and beverages	5	5	5
62	Non-alcoholic beverages	5	5	5
63	Confectioneries	5	5	5
68	Manufactured tobacco	5	5	5
69	Horticultural, floriculture florists:			
69a	Horticultural plants and stock of vegetables and fruits	2B	2B	3
69b	Horticultural flower and plants for sick room	4	4	4
69c	Horticultural flower and ornamental shrubs	5	5	5
73	Water in tank trucks	2A	2A	–
77	Milk in tank trucks	2A	2A	–
	EXTRACTIVE INDUSTRIES (Production, refining and distribution)			

All industries engaged in extracting raw materials from the earth, including mining, quarrying, drilling, oil and gas production, and logging; such as coal mining, products of other metallic and nonmetallic ores and concentrates, crude petroleum, natural gas, sand, stone and gravel, etc. The rating of trucks used in maintenance of mining facilities is the same as commodity listed.

10	Mixed raw materials[4]	–	–	–
11	Ores and concentrates:			
11a	Ores and concentrates except gold	3	3	
11b	Gold ore concentrates	5	5	5
12	Solid fuels	2B*	2A	2B
13	Crude petroleum	1	1	–
15	Mixed ice and solid fuels	2A	2A	2A
17	Quarry products	3	3	3
18	Timber (including rough sawn timber and cants)	2A	2A	–
19	Other raw materials	3	3	3
30	Other and mixed industrial basic materials[5]	3	3	3
32	Fats, oils and greases:			
32a	Petroleum, oils and greases	1	1	2B
32b	Other fats, oils and greases	2B	2B	4
70	Mixed liquid in tank trucks[6]	–	–	–
71	Motor fuel in tank trucks	1	1	2B
72	Fuel oil in tank trucks	1	1	2B
78	Vegetable and animal oils in tank trucks	2A	2A	–
79	Other liquids in tank trucks	3	3	3
	CONSTRUCTION INDUSTRIES (Materials)			
01	Service operations[6]	–	–	–
34	Paper stock and containers:			
34b	Wall paper	4	4	5
35	Lumber	3	3	3
36	Building materials and clay Products	3	3	3
37	Structural metal:			
37a	Structural metal, architectural metal work	4	5	5
37b	Structural metal, ornamental	5	5	5
38	Structural glass and stone	3	3	3
	PROCESSING INDUSTRIES (Manufacturers)			

Include manufacturing establishments of every sort and kind (whether by manual, mechanical, or chemical means or process.)

		O	WS	R
16	Gas (in containers) and special tank trucks for liquid oxygen	2A	2A	2A
31	Chemicals:			
31a	Navy, military, industrial and agricultural chemicals	2A	2A	2A
31b	Paints, varnishes and mixtures	3	3	4
31c	Dyes used in cosmetics and perfumes	5	5	5
33	Leather, rubber and plastics (non-military) including leather and rubber apparel	2A	2A	4
34a	Paper stock and containers except wall paper	2B	3	4
37c	Structural metal, industrial	2A	2A	–
39	Scrap and waste (pick up)	2B	2B	–
40	Mixed industrial war equipment*	2A	2A	–
41	Aircraft	2A	2A	–
42	Vehicles and parts:			
42a	Vehicles and parts excluding passenger cars	2B	2B	3
42b	Transportation of new and used passenger cars (except military)	3	3	3
43	Ordnance	2A	2A	–
44	Boats and Marine Equipment:			
44a	Boats and marine equipment for commercial fishing, transport and repair	2A	2A	–
44b	Pleasure boats and equipment	5	5	5
45	Munitions and explosives (civilian)	2A	2A	5
47	Industrial machinery and parts	2A	2A	–
49	Other industrial equipment	2B	2B	–
55	Apparel:			
55a	Military and industrial apparel	2B	2B	5
55b	Civilian apparel, ordinary and household	4	4	5
56	Drugs, medicines, prescriptions:			
56a	Drugs, medicines, except toilet preparations	2B	2B	2B
56b	Toilet preparations, cosmetics, etc.	4	4	5
56c	Soap	2B	2B	4
57	Furniture and household furnishings	4	4	3
58	Printed matter	3	3	5
59	Textiles:			
59a	Textiles for armed forces	2B	2B	–
59b	Textiles for civilians	3	3	4
64	Furs, musical instruments, and sports goods	5	5	5
65	Office or store furniture or fixtures	4	4	3
66	Clocks, watches and jewelry:			
66a	Clocks and watches	3	5	5
66b	Jewelry	5	5	5
67	Leather and paper articles	4	4	5
74	Chemicals in tank trucks	2A	2A	–
75	Alcohol in tank trucks and drums:			
75a	Industrial alcohol	1	1	–
75b	Beverage alcohol	5	5	–
76	Naval stores and distillates in tank trucks	3	3	–
97	Informational (news service, reporting)	5	5	5
	BUSINESS, PROFESSIONAL, PERSONAL AND REPAIR SERVICE AGENCIES AND INSTITUTIONAL AGENCIES			
		O	WS	R
05	Ambulance and hearse service	1	1	1
60	Other and mixed consumer accessories	4	4	5
90	Other, mixed or not classifiable:			
90a	Supplies for hospitals, sanitarium and charitable institutions	1	1	1
90b	Repairs for building and equipment	2B	2B	2B
90c	Repairs for equipment and appliances (non-portable)	2B	2B	2B
90d	Repairs for automotive equipment	2B	2B	2B
90e	Repairs for equipment and appliances (portable)	5	5	5
90f	Supplies and equipment for social, fraternal and athletic clubs	4	4	4
90g	Supplies and equipment for places of amusement including circuses and street shows	4	4	4
90h	Supplies and equipment for recreational establishments	4	4	–
90i	Pest control for crop protection	2A	2A	2A
90j	Films for theatres	3	3	–
90k	Circuses and other traveling shows	4	4	–
95	Laundry, linen supply, diaper service, cleaning, dyeing, tailoring	2B	2B	3
96	Finance (armored cars)	2B	2B	–

[1]A retail delivery for the purpose of this Essentiality List is defined as "a delivery to a consumer for his own personal or household use." All local deliveries other than retail are classified as wholesale deliveries

[2]Rating will be given according to the rating of the preponderance of traffic carried.

*Exception may be granted access roads to war industries and military establishments which may receive top rating.

[3]Rating will be given according to the rating of the preponderance of traffic carried.

[4]The rating of mixed materials will be determined by the rating of the preponderance of the traffic carried.

[5]The rating of mixed materials will be determined by the rating of the preponderance of the traffic carried.

[6]Rating will be given according to the rating of the preponderance of traffic carried.

*Off-the-highway for solid fuels has 2A rating whereas over-the-road operations have 2B rating.

*NOTE: 40 Mixed Industrial War Equipment includes all equipment and supplies for war industry including metal, wood, cork, asbestos, and other materials.

Gravel plant with office and shop in foreground. The cableway is shown in operation.

Ohio Producer Receives Royalty for Removing Gravel from River Channel

another ON THE SPOT report

AS the intensive war effort made by this country progressed, many aggregates producers found that their plants and equipment were wearing out due to the heavy demands made upon them. This was the condition in which the Hamilton Gravel Company, Hamilton, Ohio, found itself early in 1942. Its original wooden plant, built in 1921, was beginning to show signs of age. Its equipment, mostly of a later vintage, could also stand the replacement of a few items. It was decided to build a new plant, but no structural steel or new equipment could be obtained due to priority restrictions. It was decided, therefore, to build the plant entirely of concrete from its own new batching plant, which was described in THE CONCRETE MANUFACTURER section of the August issue, and to use the old equipment until new again became available. The new plant went into operation in September, 1942.

The reinforced-concrete plant structure was designed and built by the Vaughn Building Company of Hamilton, using slip forms for the aggregate-storage silos. The building foundations extend 14 feet below the surface of the ground to gravel. Four footings, 2 feet thick and 6 feet wide, extend the full 74-foot length of the structure. On the outer footings are 12-inch walls and on the inner ones are 16-inch walls 26 feet high which extend 12 feet above the surface to the floor of the silos. The three passages between these walls are used for truck loading and have an 8-inch floor slab at the ground level. The silo floor slab is 34 inches thick and is 74 feet long and 37 feet wide. On it rest the eight silos, arranged in two rows with three interstices. The silos are 18 feet in outside diameter, with 8-inch walls, and are 30 feet high. They are completely roofed over with concrete slabs 8 to 11 inches thick, in which openings have been left for chutes. The superstructure has a framework of reclaimed structural steel and corrugated-metal siding and roofing.

The crusher and elevator base is a separate structure containing 80 cubic yards of concrete. It is 20 feet square and rests on footings separate from the main building.

The new plant was built at the same location as the old one, about one mile north of downtown Hamilton, just outside the city limits on the east bank of the Miami River and on U. S. Highway No. 127. Its capacity of about 500 tons in 8 hours under present conditions is about the same as that of the old plant. This capacity will be doubled when new equipment is again available. About 30 per cent. of the total output is crushed gravel. The original Sauerman slackline cableway excavator system digs material from the river bed and hauls it to the plant.

In 1921, the same year the original plant was built, a low concrete dam was built across the river just below the plant by the Miami Conservancy District to retard the drift of sand and gravel at flood levels into the improved river channel through the city. This was a part of the flood-prevention work built to prevent a repetition of the disastrous flood of 1913 which caused millions of dollars of damage and cost many lives. At the height of the flood the water was 15 feet deep at the plant site and much of Hamilton was under water. The flood-prevention work was completed in 1922. There have been a number of high flood stages in the river since that time but the property of the Hamilton Gravel Company has not been under water since the original plant was built.

The completion of the dam, however, soon complicated the problem

By W. E. TRAUFFER

of obtaining material from the river. For some years enough material was obtained above the dam where the deposit was replenished every spring by high water. Since 1937, however, the year that Cincinnati was last flooded, there has been no real high water and the amount of material washed in has not kept up with the requirements of the plant. As a result digging was begun below the dam where Conservancy officials are anxious to have the material removed in order to provide a clear channel. By an agreement with the Conservancy, the company pays it 10 cents per cubic yard for material excavated above the dam and receives a royalty credit of 10 cents for that excavated below the dam.

Since 1937, however, not enough material has overflowed the dam to replenish the deposits below it and operations have been moved above it and then back three times. After the last change the material both above and below was exhausted. Now a Bucyrus-Erie 20 B gasoline dragline with a ¾-cubic yard bucket is excavating material from a river-bar deposit. This is hauled a few hundred feet in trucks to the bank of the river where it is dumped for the cableway to pick up. In this way the company is cleaning up the entire south bank of the river below the dam.

The material in the river bar varies considerably in gradation and ranges from very fine sand up to very coarse gravel with a few boulders up to ½ cubic yard in size. The Conservancy does not allow constant shifting of the dragline or cableway but planned digging has made it possible to approximate the ideal balance of 50 per cent. sand required by local needs.

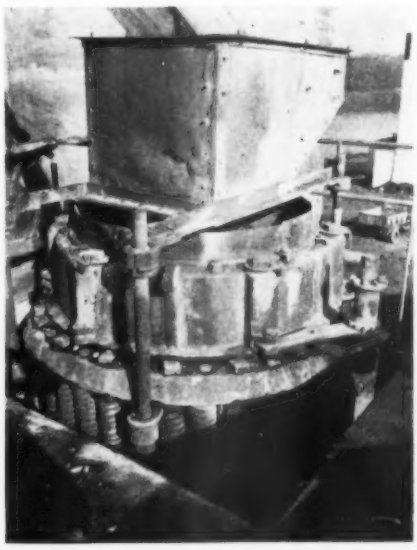
Gravel-washing screw and sand cone above the bins.

The cableway is now 1,050 feet long and extends to the far bank of the river below the dam and 700 feet below the plant. The track line of 1½-inch, 6- by 19-strand, Leschen Red Strand wire rope is anchored at its far or tail end to a cable bridle between two 18-inch-square by 14-foot-long log "dead men" buried in the ground. The load line consists of 1,150 feet of ¾-inch Leschen wire rope. The 125-foot Sauerman structural-steel mast has 6 guy wires of 1⅜-inch Leschen wire rope. The cableway is operated by a 2-drum Thomas hoist driven by a 90-horsepower motor. The hoist has two speeds, 200 f.p.m. for loading and 600 f.p.m. for hauling.

There are two 1½-cubic yard Sauerman buckets which are 22 years old. While one is in use the other is being rebuilt with hard-surfacing metal. About every second year the bottom of each bucket is replaced and new points are built on the teeth.

The bucket dumps the sand and gravel on a sloping rail grizzly at the top of the plant. This rejects all gravel over 5 inches in size which drops on a ground-level pile. The minus-5-inch material drops through the grizzly on a 3- by 6-foot Simplicity 3-deck vibrating screen, which makes 1½-, ⅜- and 3/16-inch separations.

The 1½ to 5-inch oversize gravel from this screen is chuted to the 4-foot Symons cone crusher which is set at any desired opening from 1½ down to ⅜ inch. An 18-inch Webster chain-bucket elevator on 74-foot centers feeds the crushed gravel back to the top of the plant where it is discharged on a 3- by 6-foot Simplicity 2-deck screen. This usually makes ¾- to 3/16-inch crushed gravel (Ohio No. 46) on the bottom deck and sand through this deck. Both materials drop into separate silos. The oversize gravel off the top deck is returned to the crusher.



The 4-foot cone crusher which reduces minus-5-inch oversize gravel.

This screen can also be used to make No. 6 chips between ⅜- and 3/16-inch openings and there is a

View showing chute arrangement to silos. Screens and washing screw above.

separate silo for this product. Both these sizes of crushed gravel are used for black-top roads.

The several sizes of gravel which can be made on the second deck of the first screen drop into a 16-inch by 12-foot Eagle screw washer which removes sticks, leaves, walnuts, an occasional clay ball, and other waste. This material is discharged into one of the three spaces between the silos from which it is hauled to waste in trucks. This washer has a revolving spout so that any of the three sizes made on this deck can be discharged into a separate silo. These sizes are: No. 3 or 2-inch gravel, No. 34 or 1½-inch gravel, No. 4 or 1-inch gravel.

Superintendent Hulbert Rowlands and Robert Thomas, office clerk.

The 1½-inch gravel can also be discharged into a fourth silo along with sand when making a pit-run concrete mix. This material contains gravel and sand in the same proportions in which they were dug from the bank. This product is not used in the concrete plant but is in demand locally for job-mixed concrete.

The material off the third or bottom deck of the first screen is pea gravel and is discharged into another of the interstices.

The sand which passes through the bottom deck of this screen goes to a 5-foot Webster automatic sand-settling cone. This also has a revolving spout so that the sand can be discharged into the concrete-mix or crushed-sand silos already described or into the eighth silo as concrete sand. No masons' sand is made.

Trucks are loaded through lever-operated arc gates in the 3 passageways under the silos. The company owns 4 Chevrolet 3-cubic yard dump trucks and others are hired as needed. All shipments are weighed on a Howe truck scale in the concrete-block office building.

The company also contracts for excavation work such as ditches, cellars, etc. For this work it has 2 Bucyrus-Erie 10 B shovels, one of which can be converted into a shovel. There is also a Bucyrus-Erie

View showing reinforced-concrete construction of main plant structure and crusher building.

D2 Diesel combination shovel and dragline and a ½-cubic yard Bucyrus-Erie 15B crane which is convertible into a backhoe. Two tractors with bulldozers, an Allis-Chalmers and a Caterpillar D4, complete the list of major equipment. Some of this equipment is used at times about the plants and yard for clean-up, rehandling stock-piled materials, etc.

When the company was formed 23 years ago W. P. Watson was made general manager. Later he became secretary and treasurer also. In World War I Mr. Watson served as a major in the Coast Artillery Corps and later was commissioned a lieutenant-colonel in the reserves. On May 25, 1942, he was called back into active service with that rank and is now in command of the 770th Military Police Battalion, stationed at present at Camp Des Plaines, Joliet, Illinois. In his absence Mr. Watson is acting as general manager and secretary. Hulbert Rowlands, superintendent, has been with the company for over 20 years, most of the time in that capacity.

J. H. Mallon Advanced by Louisville Cement

John H. Mallon

John H. Mallon has been elected vice-president in charge of sales by the board of directors of the Louisville Cement Company. Mr. Mallon has been with the company for almost 25 years, and for the past six years he has been sales manager.

Starting with the Louisville Cement Company in 1920, Mr. Mallon has become known as one of the leading figures in the development and growth of the masonry-cement industry, and as a recognized authority on mortar, brickwork, and natural cement. His investigations and research on water-tight masonry have become a part of the building industry's accepted data on that important subject.

As vice-president, Mr. Mallon will continue to direct the sales, advertising and promotion departments of the company.

Primary Highways Holding Up Well

Primary highways of the United States are holding up better than many urban streets and most back country roads under the stress of wartime restrictions on new construction, lack of adequate equipment and the manpower shortage, according to data collected by the Office of War Information from the Public Roads Administration and State and private agencies interested in highway upkeep. These data point to progressive deterioration of varying intensity, O.W.I. said.

Some of the deterioration, road experts pointed out, is of the cumulative type, leading to serious road damage in a year of two. Three factors, according to P.R.A., determine the efficiency of a higway system: new construction, improvements and maintenance. All three, of course, were affected by the war.

Since 1930 accent has been on rebuilding and modernizing highways rather than on extending the size of the system. P.R.A. figures show that between 1936 and 1941 there was a decrease of 3,500 miles in the net length of the primary State highways to a total of 331,624, but nearly 100,000 miles of replacements and reconstruction were effected.

Since 1941 the road-building program has been confined almost entirely to work on roads to serve war needs, such as military roads and roads leading to war plants. Many of these will serve peacetime needs, but most will not directly benefit the primary road system.

P.R.A. figures show that in the fiscal year of 1941 most of the 12,936 miles of new federal-aid roads were for normal purposes; in 1942 much of the 10,178 miles were roads of war significance, while the 1943 program of 8,445 miles excluded all but such roads. That program is now drawing to a close, with total construction in 1944 estimated at about 5,500 miles.

Marquette's Des Moines Plant Dedicates PCA Safety Trophy

THE Portland Cement Association Safety Trophy was presented to the Des Moines plant of Marquette Cement Manufacturing Company at a ceremony held at the plant, Monday, July 17. The trophy was awarded the plant for having gone through 1943 without a single member of the organization having lost any time as a result of an industrial accident.

The program opened with the recitation of the Pledge of Allegiance to the Flag, and this was followed by the flag raising by veterans of World War II.

Acting as master of ceremonies, J. C. Bennett, superintendent of the Des Moines plant, welcomed the assemblage and voiced his pleasure and pride in the occasion. "This celebration is for the employees and their families," Mr. Bennett said, because it was their co-operative effort that enabled us to win this handsome trophy." He then introduced A. J. R. Curtis, assistant to the general manager of the Portland Cement Association, who made the presentation of the safety trophy. Mr. Curtis said in part:

"Our great republic succeeds largely because of our strong interdependence, one upon another. Our responsibility for each other in the matter of personal safety is very great. Unless each assumes his full part no one can be sure that he is safe anywhere. Hitler and Tojo are the arch-betrayers of human safety but the man who is unwilling to guard himself and those near him varies from them only in degree. We are happy that there are no such men here.

"Safety here depends upon all who are a part of this great plant. Had not your company heads, including Messrs. Wecker, Richard Moyle, Sr., Kelly, Hanley, Frank Moyle, Bennett, Mandia, and your foremen and safety supervisors, been genuinely interested and constantly on the alert, you could not have won the splendid award that we celebrate to-day.

"But great as their responsibility is, they must yield to you men of the mill the last and the decisive opportunity to prevent almost every accident. Protect you as far as they may be able, you are finally 'on your own' and unless the invariable personal habit has been formed of refusing to take a chance, a situation may arise in which a man can not save himself from accident nor can anyone else save him.

"So it seems to me that a very great deal of honor and praise for the achievement we are celebrating belongs to you men of the mill organization and I extend to you hearty congratulations."

Mr. Curtis thereupon presented the trophy. In accepting it, Albert Silio, Des Moines plant employee, said:

"Every one of my fellow employees is filled with justifiable pride at his part in the achievement which is being recognized here to-day, and, we assure you, this trophy will mean a further incentive toward safety to the Des Moines plant employees. It gives me genuine pleasure, Mr. Curtis, and it is with real pride that I accept this beautiful trophy on behalf of all the employees of this plant."

R. Moyle, Sr., vice-president of the company, a veteran of over fifty years in the cement industry, was then called on. He said in part:

"During my fifty-two years in this industry, I have done about every job that you men are doing to-day, so I know firsthand the hazards that you encounter and the constant vigilance that must be exercised to prevent accidents, and I salute you men for your wonderful accomplishment." Mr. Moyle also paid tribute to the families of the employees, who, he said, deserve no small amount of the credit for the elimination of accidents. He urged continued co-operation and said, "The lessons we have learned in our safety work clearly demonstrate that men and management working together for a common goal can, because of their mutual interest, successfully meet all problems of industry."

The principal speaker was W. A. Wecker, president of the company. In commending the men for their achievement, he said:

"Ben Condon, whom you will remember as the general manager of the old Hawkeye company, once told me just before his passing, that among his unfinished business was the job of getting you men to win for yourselves one of those safety trophies such as has been unveiled to-night.

"Ben had the right idea about whose job it was and he knew that all he could do was to coach from the side lines. When we came along, we became Ben's successor in the coaching end of this safety business but it remained for you to carry the ball through for a score. This you did last year in bang-up style and now, therefore, all the congratulations and glory belong to you. . .

"In this Marquette league, of which you are now a part, all are champions and some have hung up an enviable record on a protracted winning streak. But there is no reason why you shouldn't accept the challenge of that record and start now to keep right up to it. You know all the rules and you know the requirements. Your coaches at best can merely keep reminding you of them. But listen to them as all good players do. If you'll do just that, you won't be able to crowd safety out of your mind. After a while it will become a habit and as you get the habit you, in turn, will be coaching the newcomer or your neighbor who may be just a little bit overconfident and, perhaps, at times, just a little bit careless.

"While I stand up here I can't refrain from saying a word or two on another subject. This is the vital and often touchy subject of the relationship between those two parts of any business called labor and management. In the first place the terms used seem to me to be wrong because I can testify that management, too, is simply another group that labors. In the second place I could never understand why the subject should be a touchy one at any time.

"Marquette management believes

W. A. Wecker, president, Marquette Cement Manufacturing Company.

that it understands the problems and needs of the employee groups. It believes, too, that its employee groups understand the basic problems of management.

"Out here at Des Moines both of us seem to be in a particularly favorable relationship. You are nearly all old union men. Your union leadership is experienced and adept. The result is that you are most apt to see both sides of a problem and we always try to do the same. In consequence we get along. Of course, you don't always like all that we may want to do and that goes for us, too. But so far you and we have compromised all our differences man to man and neither of us has yet found it necessary to call in a paternalistic government bureau to settle problems for us. This is indeed a happy situation and you should be as glad about it as we are.

"Unfortunately, however, there is still much strife in the land between management and labor. I have read much from both viewpoints on these difficulties and, of course, they stem from many causes. Running through it all, however, is a lack of understanding between the contending parties of each other's problems and often this lack of understanding, after nerves become frayed and emotions are aroused, develops into a stubborn refusal to understand.

"Perhaps it would not be amiss here to-night to point out some of the major things that labor and management will have to learn about each other if we are to achieve in this country a sound relationship between the two and the ability to get along with one another. I shall not attempt to go into details on a subject that has as many angles as this one and shall try merely to point out the bigger things.

"Management must recognize that workmen have the right to organize for collective action in their dealings with management. Management must enter into negotiations with the chosen representatives of the workmen wholeheartedly and with enthusiasm. Beyond this management must recognize its share of responsibility in the matter of providing work and jobs. It must recognize, too, its share of responsibility in the general improvement of the standard of living of its employees and it must always hold open the avenues of advancement for those who seek to forge ahead.

"Labor must learn that management has other responsibilities, too, besides those to labor only. It must learn that management has the responsibility of making and offering goods and services to the public at prices the public can pay and that, beyond this, it must get out of those prices, not only what labor requires for its use, but also something to pay to those who provided the money which bought and built the tools and plants which you use to make your livelihood and which both of us use to make the goods we sell to the public.

"Labor needs to understand more fully that management's job has three distinct parts which we will sum up as follows:

"1. Provide work and jobs at good wages.

"2. Make goods for public use and sell them at fair prices.

"3. Keep enough after all expenses to pay for the use of capital at risk in the business.

"A fourth might be added. That is that management should provide reserves for a rainy day. If it doesn't, then it may have to quit when some misfortune befalls it and that, of course, is bad for labor. Reserves too, of course, have to come out of the money received for the goods sold along with wages, dividends and all the other expenses of running a business.

"We think that you out here understand these things about the functions of management and, as I said before, I think we understand your problems and your needs. With such a basic understanding there is no reason why both of us should not continue in the fine relationship of the past and, by our joint example, inspire others on both sides to do likewise."

Following the ceremony, the visiting guests, the employees and their families enjoyed a box luncheon, served on the plant grounds.

Bessemer Quarry Wins 1943 Safety Contest

Eleven out of 34 plants that participated in an accident-prevention contest among quarry and crushed-stone operations during 1943 were operated during the contest year without a lost-time or disabling injury among the workers, according to an examination of reports furnished by operating companies to the Bureau of Mines. The contest of 1943 was the 18th yearly competition conducted by the Bureau of Mines in coöperation with the National Crushed Stone Association.

The winner of the safety trophy for 1943 was the Bessemer limestone quarry of the Bessemer Limestone & Cement Company, at Bessemer, Pennsylvania. This quarry was operated for 368,483 man-hours during 1943 without a disabling injury to an employee. The safety trophy won by the Bessemer quarry is a bronze plaque on which is portrayed in bas-relief the quarry scene on the pedestal of the "Sentinels of Safety" trophy awarded in the Bureau of Mines National Safety Competition.

In addition to the trophy, each plant, other than the trophy winner, that operates throughout the year with an accident-free record receives honorable mention and is awarded a parchment reproduction of the quarry scene on the bronze plaque. Each employee of the plants with accident-free records is presented with a Certificate of Honor. The trophy, parchment reproductions, and certificates are usually presented at the annual convention of the National Crushed Stone Association.

Nine plants were awarded honorable mention for operating throughout the year without a lost-time or disabling injury to an employee. These plants are as follows:

1. Leroy limestone quarry, LeRoy, New York, operated by the General Crushed Stone Company, worked 99,104 man-hours;

2. Rock Hill trap-rock quarry, Quakertown, Pennsylvania, operated by the General Crushed Stone Company worked 89,374 man-hours;

3. Oglesby limestone quarry, Oglesby, Illinois, operated by the Marquette Cement Manufacturing Company, worked 81,343 man-hours;

4. Marquette limestone quarry, Cape Girardeau, Missouri, operated by Marquette Cement Manufacturing Company, worked 68,197 man-hours;

5. White Haven sandstone quarry, White Haven, Pennsylviana operated by the General Crushed stone Company, worked 53,132 man-hours;

6. Catskill limestone quarry, Catskill, New York, operated by the North American Cement Corporation, worked 48,966 man-hours;

7. No. 4 trap-rock quarry, Plainville, Connecticut, operated by the New Haven Trap Rock Company, worked 37,736 man-hours;

8. Jordanville limestone quarry, Jordanville, New York, operated by the General Crushed Stone Company, worked 37,019 man-hours;

9. No. 5 trap-rock quarry, Granby, Connecticut operated by the New Haven Trap Rock Company, worked 10,248 man-hours.

Virginia Quarry Swings from Highway Materials to Agricultural Stone

View of the pulverizing plant. The small building at the left is used for winter storage of agricultural limestone.

another ON THE SPOT report

ORGANIZED about six years ago for the production of road stone, the firm of Fred K. Betts, Jr., Inc., of Harrisonburg, Virginia, foresaw that the war effort would inevitably bring about sharp curtailment of road construction and maintenance programs. Unwilling to hibernate through the war years, in 1941 Mr. Betts installed a pulverizing plant for agricultural limestone, and he has had the satisfaction of seeing his judgment vindicated to the extent that at present 95 per cent. of the plant's total production is being applied to farm lands in Rockingham County, Virginia.

The stone for this operation is quarried from a 67-acre deposit that runs over 94 per cent. Ca CO_3. At present the working face is 30 feet high, but there are indications that the deposit may run 4,000 or more feet in depth. Mud seams are plentiful throughout the deposit, and to minimize trouble from this source the present practice is to strip the top 8-foot layer of rock. The face is then worked in two lifts.

Ingersoll-Rand drills are used for drilling the 30-foot blast holes, and air is supplied by an Ingersoll-Rand stationary compressor. Blasting with 40-per cent. dynamite, about two tons of rock is brought down per pound of explosive. The rather high cost of 8 cents per ton for explosives is attributed to the prevalence of mud seams, which necessitate a considerable amount of secondary blasting of oversize rock.

An Erie B ¾-cubic-yard steam shovel loads the rock from the quarry floor into dump trucks, in which it is transported to the primary crushing plant. Here it is dumped into a hopper which feeds the Diamond 15- by 36- inch primary jaw crusher. Secondary crushing is accomplished by a Diamond 12- by 24-inch jaw crusher. A three-deck Diamond 5- by 8-foot vibrating screen sizes the material before it is stored in overhead bins. A Good Roads 11- by 28-inch jaw crusher is available at the primary plant for back-up and auxiliary crushing capacity.

By WILLIAM M. AVERY

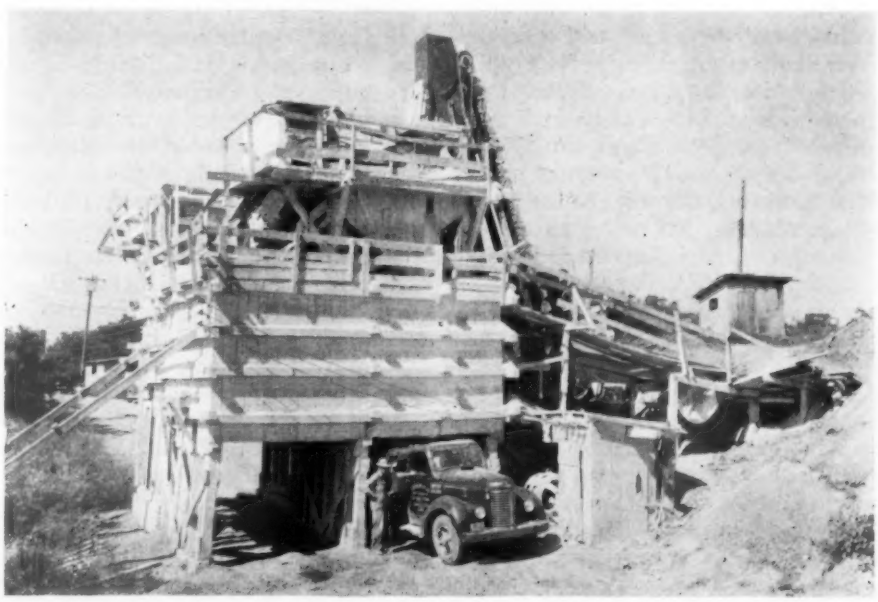
The minus-¾-inch material is trucked to the pulverizing plant, where it is dumped into a 15-ton hopper, which feeds a Jeffery bucket-elevator discharging into a 75-ton raw stone surge bin. From the bin the stone flows by gravity to a Bradley circular-plate feeder which is controlled by amperage on the 100-horsepower pulverizer drive motor.

The Bradley-Hercules Junior pulverizer is fitted with a 7-mesh wire screen which produces 100 per cent. through a 10-mesh screen, 89 per cent. through 20-mesh, 61 per cent. through 60-mesh and 61 per cent. through 100-mesh. The 100-horsepower Allis-Chalmers drive motor is mounted on a high reinforced-concrete pier, and is direct-connected to the pulverizer through a Bradley-Hercules flexible coupling.

The ground limestone drops from the pulverizer into a worm-conveyor, through which it is fed to a Jeffrey bucket-elevator and deposited in a 75-ton truck-loading storage bin.

Practically all the plant's output is sold direct to the A.A.A. Four trucks are used in the 10-mile aver-

(*Continued on page* 78)



The primary crushing plant where stone from the quarry is reduced to minus-¾-inch.

THE STATUS OF ROAD-FUND DIVERSION

another P and Q exclusive

AMONG the most significant aspects of current federal and state movements toward a post-war program of unprecedented highway construction are increasing indications of an impending climax in highway-fund diversion and other financing issues which may result in the widespread adoption of more sound and stable practices in this field.

Controversy over the formula to be used in apportioning a proposed three-year federal-aid highway fund of $1,500,000,000, and whether it should be matched by the states on a 50-50 or 75-25 basis, was so intense some time ago as to lead some observers to predict that the entire matter might carry over to the next Congress. Differences of opinion on the apportioning and matching details, however, had not dimmed the expectation that federal funds eventually will be made available for the immediate post-war years in amounts more than twice as large as normally received by the states.

With this prospect of large-scale entrance of federal money into the highway-construction field comes a growing demand from highway users and others who have long fought the misapplication of automotive-tax revenues for a strengthening of federal-aid law penalties against states that divert motor-vehicle revenue to other than highway construction and maintenance purposes.

Non-diverting states, as well as highway user interests and other anti-diversion forces, will join increasingly in the pressure for a tightening of the federal-aid law's anti-diversion provisions, which heretofore have been largely ineffective. Stimulating the interest of many states in this respect is the effort being made by the populous areas to obtain the adoption of a formula making population a greater factor in the allotment of post-war federal aid for highways, despite the fact that the populous areas have been the most guilty of diverting road funds to other uses.

Calling for a formula placing increased emphasis on population are such states as New York, which in the past ten years has diverted an estimated total of more than $626,000,000 of highway funds; New Jersey, which in a like period diverted more than $129,000,000; and Massachusetts, with a comparable diversion record exceeding $100,000,000.

As long as federal aid comprised a comparatively minor portion of the total road-building expenditures, state officials were not too greatly concerned with whether or not other states were misapplying their state road money. But, with federal funds now looming as the dominant factor in highway construction, at least during the early post-war years, non-

By BETHUNE JONES

diverting states are unlikely to sit back while others which have drained their road funds through diversion receive equal treatment from Washington and even clamor for special consideration.

If this drive for stronger federal penalties against diverting states bears fruit and brings about an effective nationwide abolition of the diversion practice, it may have an even more lasting effect on the highway-construction picture than the huge post-war fund itself. Turning to the practice on a broad scale during the depression decade as a means of bolstering sagging revenues from general tax sources, the states in the past have diverted a total of more than $2,000,000,000. In the period 1933 to 1941 the states diverted some $1,750,450,000 of highway-user funds to unrelated purposes. Adding the amounts since diverted, the total would go over the two-billion mark.

That the practice remains a very great factor in highway construction, despite the progress of opposition campaigns, is indicated by the fact that diversion reached its peak in 1941 with a total of $215,039,000. This amount would maintain the entire 475,000-mile highway system of the states for a year. With automotive tax receipts declining because of the war, the actual dollar amount diverted in 1942 declined slightly, but the total proportion diverted increased in 1942 to 15.5 per cent., from 14.8 per cent. in 1941. While statistics for last year are not yet available, a similar situation will be shown.

Nor have the states been the only diversion offenders. Of some $600,000,000 collected by the federal government in motor-vehicle excise taxes in 1941, only $157,000,000 was returned to motorists in the form of federal aid for highways. The remaining $443,000,000 which went into general funds was only about $50,000,000 less than the normal annual total expenditure by the states for highway construction.

If the federal government is to tighten its policies against the diversion of state highway funds, it will place itself in the position of having to answer for its own use of automotive-tax receipts for general purposes. The long-range outcome may be the permanent availability of more adequate funds for highway construction and maintenance.

Meanwhile the campaign to curb highway-fund diversion through state constitutional amendments is making further progress this year, although blocked in at least two major instances.

An anti-diversion amendment died in committee during the 1944 session of the New York state legislature. Favorable action would have sent the issue to the voters this fall, since the proposed amendment had been passed by the 1943 legislature. Now, however, the whole process will have to be started over again, with the approval of two successive legislatures required before a referendum can be held. The amendment which died this year would have applied only to the state's regular 2-cent gasoline tax and not to two 1-cent "emergency" levies on gasoline.

Ignoring appeals for the inclusion of a provision outlawing highway-fund diversion in a revised constitution to be submitted to New Jersey voters this fall, the current-year legislature in that state approved a provision eliminating the present state highway fund and merging automotive taxes with general funds.

New York and New Jersey have long been among the outstanding offenders in the misuse of automotive-tax revenues, with this year's failure of the anti-diversion forces on those fronts marking a lack of change in the situation rather than a setback. In both states diversion is expected to be curtailed sharply when labor and materials again become available to meet accumulated highway construction, reconstruction and maintenance needs.

Scores were chalked up by the anti-diversion campaign in the 1944 legislative sessions of Kentucky and Virginia. A state constitutional amendment outlawing highway-fund diversion will be submitted to Ken-

tucky voters next year, as the result of 1944 legislative action. The Virginia legislature approved a resolution asserting it was "the sense of the General Assembly" that all funds received from gasoline and motor vehicle registration shall be used "solely and exclusively" for highway construction and maintenance after certain expenses are taken care of. Although lacking the permanency and certainty of a constitutional provision, this expression of sentiment was welcomed by diversion opponents as a step in the right direction

Missouri's present constitutional ban against diversion appeared unlikely to be eliminated or weakened by a state constitutional convention in progress there. The convention has moved, however, for the elimination of existing constitutional barriers to the use of state funds for the construction of roads through cities. This step was held necessary for adequate Missouri participation in federal post-war road plans.

Constitutional revision also is currently under way in Georgia, where an anti-diversion proposal was pending at this writing. The present administration in Georgia is reported to be attempting to pay the state out of debt with the use of highway funds, while the state's highways are falling into dangerous disrepair. To relieve the state's dependency on the gasoline tax as its major source of revenue some groups are urging the adoption of a sales tax.

As a result of action taken by 1943 legislatures, two states—Maine and Washington—are scheduled to vote this fall on constitutional amendments outlawing highway-fund diversion.

In view of the fact that such referendums have not heretofore been defeated in a single instance where they were clear-cut issues, observers look for the addition of Maine and Washington to the list of 14 states already having such constitutional protection for highway revenues. These states are Iowa, Oregon, West Virginia, Kansas, Missouri, California, Colorado, Idaho, Michigan, Minnesota, Nevada, New Hampshire, North Dakota and South Dakota.

Similar amendments will be pressed in many states next year, when most of the legislatures in the country will be in regular session as compared with the light legislative activity of the current year. An anti-diversion amendment approved by the 1943 Pennsylvania legislature will be up again in that state next year and, if approved, will go to the voters. Plans for such amendments now are being laid in many other states.

With the current interest in state post-war highway plans serving to illustrate the fallacy of the diversion practice, there will be forceful opposition ammunition on hand when the heavy year of 1945 state legislative activity gets under way. In some states there is the possibility of even obtaining a reversal of the diversion practice, with general funds being used to augment automotive-tax revenues in financing the states' share of the contemplated gigantic post-war construction program.

While a number of states have sufficiently sizeable highway-fund surpluses to get through at least the first year of the projected federal-state construction program without the issuance of new road bonds or added taxes, many states are short because of the war-time shrinkage of automotive-tax receipts and past diversions. Meanwhile general revenues in most states have been pouring in at unprecedented levels and state treasuries are bulging in many instances.

Surplus state funds of all kinds, but largely comprised of general tax revenues, are currently estimated in excess of $1,000,000,000 and probably will be well over that figure by the time post-war plans reach the action stage. Thus, the factors are present for a logical drive for a return in many instances of some of the highway funds previously diverted to general purposes. Even in some states which have not resorted extensively to diversion, it is not unlikely that general funds may be used for post-war highway construction in recognition of the contribution of such projects toward easing the transition period.

Diversion is only one of the past evils in highway finance that will come to a head as the post-war program develops. A clear perspective of the situation can be gained by looking back to the various phases through which highway financing has passed.

Tolls were, of course, the characteristic means of financing early roads, but this procedure had been on the way out for some time prior to the close of the last century. Local communities took over the responsibility of financing roads and, as the motor vehicle grew in importance, the states began to issue bonds and make appropriations for highways. The latter at first were made principally from general revenue sources, although New York introduced the motor-vehicle fee as far back as 1901 and other states were quick to pick it up. State highway departments came into being and the Congress inaugurated federal highway aid in 1916. The states that year collected some $26,000,000 in motor-vehicle registration fees—virtually the only automotive-tax revenue source at the time. By 1918 the receipts from registration fees had climbed to $50,000,000.

After the close of the last war highway financing entered a new phase, marked by wholesale state and county bond issuance and the advent of the gasoline tax and tremendously increased automotive-tax yields. County governments issued nearly $2,000,000,000 of highway bonds from the armistice to 1930. The state governments were slower in issuing bonds, with only $200,000,000 outstanding in 1920. They turned increasingly to bonds, however, and such revenues furnished approximately one-quarter of the states' highway spending from 1921 to 1925.

Oregon introduced the gasoline tax in 1919 to provide funds to maintain roads originally financed with bonds, whose debt service was absorbing the bulk of motor-vehicle registration-fee revenue. In the ensuing decade the gasoline levy spread to every state. With motor-vehicle registration jumping from 9,000,000 in 1921 to 19,000,000 in 1926, the states received an enormous revenue gain. By 1930 the automotive-tax revenue of the states had reached $850,000,000, as compared with only $100,000,000 in 1920.

With the depression came another phase in highway financing. Decreasing state and local general taxes brought telling pressure for gasoline-tax rate increases and thus was born the large-scale diversion evil. Only a few states had resorted to diversion prior to 1930 and only in relatively small amounts, but soon after the turn of the decade nearly three-fourths of the states were raiding their highway funds for general purposes and by 1933 an average of 15 per cent. of total highway-user taxes were being misapplied.

Federal revenues also were depressed, with the result that the Congress in 1932 inaugurated a duplicating tax on motor fuel and, although this levy was originally termed "temporary," it is still here, along with other federal taxes against highway users. And, since the great bulk of such revenues have been used for general purposes, the large federal road expenditures now proposed will actually amount to nothing more

than returning to highway users what has long been due them.

The depression decade also saw a marked shifting of financial responsibility for local roads from local units of government to the states, a trend which still continues. The shift, starting on a small scale in the late 'twenties, was accomplished mainly by state assumption of locally-incurred bond obligations and the absorption of local roads into state highway systems. An accompanying trend, also still continuing, was the increasing sharing of state-collected automotive-tax revenues with local governmental units.

A leveling off of these various earlier trends was noted in the years just prior to our entry into the present war. Gasoline-tax increase pressure had abated; the anti-diversion movement was gaining ground; pressure was mounting for a check on the assumption by the states of local road responsibilities; and states were moving toward highway construction financing on a pay-as-you-go basis.

The post-war period will bring with it an entirely new phase and one which in many respects appears at first glance to invite a repetition of some of the past difficulties. On closer analysis of all the factors involved, however, a sounder long-term trend in highway financing seems possible, if not probable.

There are those who would go all the way back to the toll-road stage. Despite the engineering greatness of the toll-financed Pennsylvania Turnpike and the existence of successful toll parkways in some states, there is little basis for belief that toll financing will reach major proportions in the total picture. Besides strong opposition from highway users, another very significant barrier is the federal government's steadfast refusal to permit tolls on any highway to which federal funds have contributed. After the Federal Bureau of Roads expressed its intention of adhering rigidly to such a policy, Governor Thomas E. Dewey of New York this year vetoed a bill which would have permitted Westchester County to collect tolls on its parkways.

A vast need for the construction and reconstruction of highways, together with prospects of unprecedented automotive production for at least a decade, would seem to take us back to a picture not dissimilar to that after the last war. But the similarity doesn't go much further. The states now have an automotive-tax structure functioning and an accumulation of both highway and general funds, together with the expectation of tremendous federal aid.

While the states undoubtedly will have to resort to bonds and added taxes to some extent in raising their share of post-war road costs, there will be strong pressure to keep such financing from getting out of hand. This will be true particularly where bond issues are proposed. Although bond issuance makes available immediately a greater amount of funds for highway construction than can otherwise be derived, it is recognized as tending to reduce the proportion later on because of high debt-service costs. Having learned this lesson as a result of the flood of bond issues which followed the last war at their insistence, highway users are now adopting a cautious viewpoint.

As after the last war, counties and cities will again embark on large-scale highway construction. They are already planning major projects on their own, independent of those to be undertaken in conjunction with federal and state governments. If their various contemplated expansions of services is carried out, they will intensify their pressure for larger shares of state-collected revenues. While this looks very much like a repetition of what has gone before, there is the difference that current planning is on a scale so vast that a clearer definition of the various spheres of governmental units in the highway-financing picture is virtually certain to be forced, with obvious long-range benefits.

The most striking difference between the period we are about to enter and the past is, of course, the advent on the scene of the federal government as a major instead of comparatively minor contributor. When the less than $200,000,000 which the federal government has been contributing annually in state aid for highways is compared with the proposed outlay of $500,000,000 a year, it becomes plain that the picture will change rapidly.

Many controversial issues which have long clouded highway financing will be forced to a showdown and, despite the conflicting views expressed during congressional hearings on the subject, the final outcome may well prove beneficial to all concerned with highway construction and use.

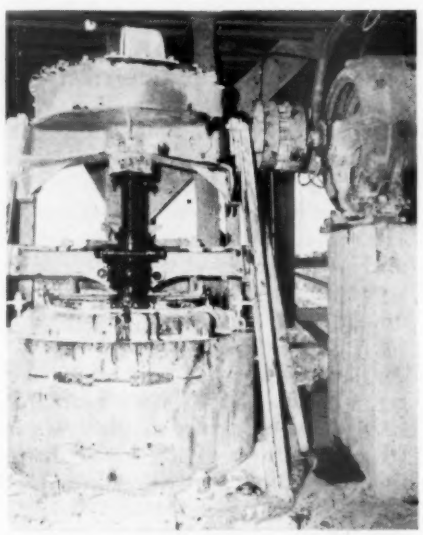
Betts *(from page 75)*

age haul to farms in Rockingham County. Mr. Betts thinks that after the war he may operate his own spreaders in order to encourage farmers to avail themselves of the benefits to be derived from liming their soil.

In laying out his plant Mr. Betts provided space for the installation

The 15- by 36-inch and 12- by 24-inch primary crushers.

at some time in the future of a Tyler-Hummer screen which will enable him to produce a material passing 100 per cent. through a 100-mesh screen. This provision was



The pulverizer which is fitted with a 7-mesh screen.

made in anticipation of a chemical-limestone market which will very probably develop soon after the war. Mr. Betts may, or may not, be a devotee of the ancient game of chess, but plainly he operates his business on the sound chess principle of "playing ahead" as many moves as possible. For proof that the practice is as unimpeachable in business as it is in chess, Mr. Betts has only to reflect that his plant is to-day almost entirely devoted to the making of a product for which it was not even equipped until three years ago.

Saved . . . One Crusher Mantle!

AT a limestone-crushing plant a fracture 28 inches long developed in a manganese-steel crusher mantle. The company had to decide whether to order a new casting, which might take months to obtain with the possibility of complete failure of the damaged casting in the meantime; or to repair the fractured mantle by welding. The company's welders were dubious about tackling the reclamation of this 14,000-pound casting which was 3½ inches thick.

The crusher operator knew that the American Manganese Steel Division of the American Brake Shoe Company manufactured welding materials, as well as manganese steel castings, so he called on that company for advice. Amsco engineers prescribed the following procedure for salvaging the mantle, the crack in which, before welding, is shown in Figure 1.

Figure 1.

Figure 2.

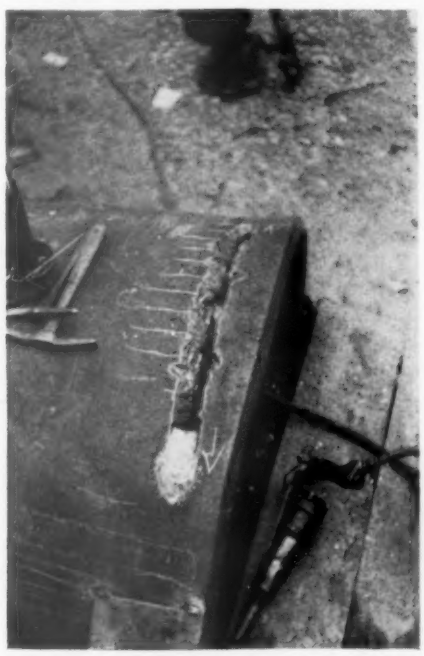


Figure 3.

First, all defective metal was burned out, and the area to be welded, cleaned of scale and ready for welding, is shown in Figure 2.

The problem of welding austenitic manganese steel, especially in a job of this size, differs from that of welding carbon steel, as the thermal conductivity of manganese steel is low, and the metal structure is rather easily degraded by the continuous application of more than moderate heat over substantial areas.

These factors suggest the welding of manganese-steel castings by the "back step" method, which was, in fact, employed in rehabilitating the 14,000-pound mantle. The 28-inch crack was laid out in fourteen 2-inch steps, as shown in Figure 3, in which the welding has begun. The welder applied Amsco nickel-manganese steel welding rod and, as one 2-inch section was completed at one end of the crack, he moved to the other end and filled in a 2-inch section, working toward the center of the fracture.

Figure 4.

Figure 5.

A helper peened each deposit thoroughly, using a pneumatic hammer. This peening, as a stress-relieving measure, is of prime importance in the welding on manganese steel.

Figure 4 shows the precautions taken to protect the welder from unfavorable weather. It is desirable, once a large manganese-steel job is started, to complete the weld without letting the casting become cool. However, at no time during the

(*Continued on page* 81)

Grinding Pebbles from Texas Help to Supply Demand as Imports Cease

Some of the sacked pebbles and the picking conveyor at the Lilesville plant.

another ON THE SPOT report

THE cutting off of imports of flint grinding pebbles and mill liners by the German occupation of Europe at first worked a hardship on those producers of nonmetallic minerals and other materials who must avoid iron contamination in grinding. The few existing producers of domestic pebbles and liners were unable to meet the demand with a product equal to the imported and an intensive search for new sources of these materials began. The Southern Products & Silica Company of Lilesville, North Carolina, was one of the leaders in this search and is now one of the leading producers. Buebendorf Brothers, New York, the largest importers of French and Danish pebbles and Belgian Silex lining blocks before the war, became associated with this company in an endeavor to develop a product equal to the imported and handle all the sales of its grinding media.

The Southern Products & Silica Company, now owned jointly by W. R. Bonsal Company, Hamlet, North Carolina, and the Charlotte Chemical Laboratories, Charlotte, North Carolina, was formed in 1933 to build and operate a plant at Lilesville for the production of filter media, chemical quartz, blasting and chemical sands and other special products. The materials used were obtained from the deposit which supplies Bonsal's adjacent sand-and-gravel plant. This is said to be one of the largest deposits of pure quartz in existence, analyzing 98.7 per cent. SiO_2. This specialty business actually began in 1908 when the Oliver Quartz Company shipped materials from this deposit to its plant in Charlotte, where chemical quartz and acid-proof cement were made. The Charlotte Chemical Laboratories is the successor to this company and markets the filter gravels and sands, blasting sands, etc., now produced. The regular sand and gravel are sold by the W. R. Bonsal Co.

The first attempt to make grinding pebbles from the Lilesville deposit was made in 1938 but this material was found unsuitable for some types of grinding. In looking for other sources of supply Buebendorf Brothers located at Glidden, near Columbus, Texas, some flint pebbles which closely approximated the imported materials in hardness and chemical analysis. The processed flint pebbles have a hardness of 8 plus by the Mohs scale. Grinding tests showed a weight loss of 0.72 per cent. compared to 0.50 per cent. for French flint pebbles and as the pebbles became smoother by mill action their rate of loss was only slightly above that of the French pebbles. As a matter of fact, several of the largest producers of silica

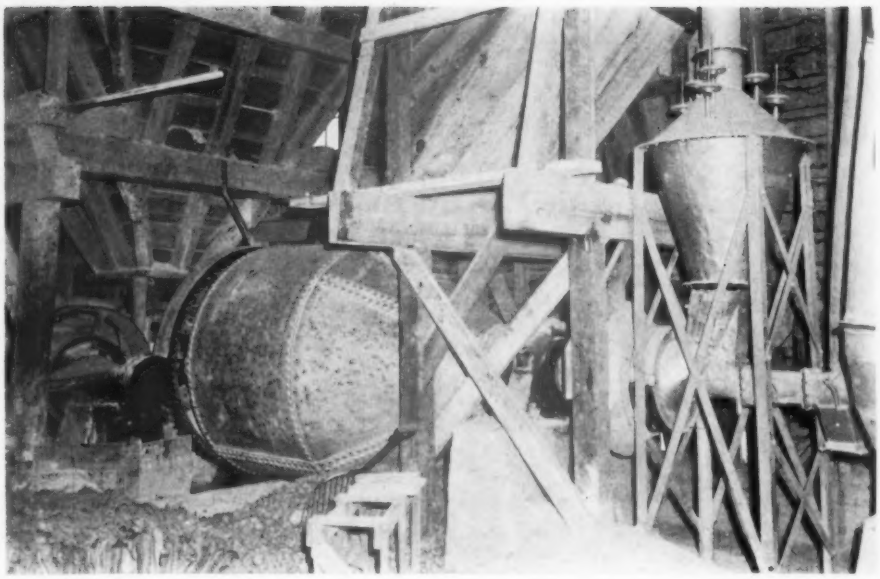
By W. E. TRAUFFER

flour, after months of accurate checking, have reported identical resistance to abrasion, and equally high production of silica with the use of these domestic flint pebbles as compared with the imported pebbles.

Originally the crude Texas flint pebbles were shipped to the Lilesville plant for processing and in May, 1942, the growing demand necessitated the construction of a larger plant there to supplement the original one. Later the uncertainty of railway transportation and economic factors made it advisable to move the new plant to Glidden and this was done early in 1943. The Lilesville plant then processed only local materials.

The demand for the domestic flint pebbles continued to increase at such a rate that the Glidden plant was compelled to operate 24 hours daily and 7 days per week. The

The filter-gravel plant with the sand-and-gravel plant in the background.



The 6-foot conical mill with classifier at right.

output of the Glidden plant is now confined to 7 sizes of pebbles from 1 to 6 inches in diameter and only carload orders are taken. On this basis the plant is producing 300 tons of pebbles per month.

Some crude is shipped to Lilesville where 10 sizes of pebbles are made from ½ up to 6 inches in less-than-carload lots. The capacity of this plant is about 100 tons per month.

Some customers still prefer pebbles from the Lilesville deposit because of their greater grinding capacity where silica contamination of the product is not a factor. This material is also processed at the Lilesville plant.

Drier, elevator and screen used for sand-blast and filter sands.

At Glidden the hand-selected crude flint pebbles are dumped from trucks into a hopper from which they are taken by a bucket-elevator to a bin. The pebbles are then batched into a 7- by 10-foot tube-mill. The milling time varies with the quality of the crude and the size of the product desired and averages 3½ hours. A finished batch is dumped from the mill into a hopper over a belt-conveyor which carries the pebbles to a 2-deck Allis-Chalmers Low Head screen. A split bottom deck on this screen makes it possible to produce 5 sizes of pebbles at one time as perfect separation is not essential. Each size drops into a separate bin. One size at a time is then carried on a picking belt-conveyor for the removal of stone of low quality, quartzite, chert, etc. The finished pebbles are stored in piles from which they are shipped out in sacks or in bulk.

At Lilesville the crude Texas flint pebbles are unloaded from gondola cars and are processed separately from the local pebbles. In this plant an 8-foot-diameter Hardinge conical mill is used for the wet grinding of local pebbles, chiefly in large sizes. A 6-foot Hardinge conical mill, ordinarily used to grind silica flour, is also used to process the crude flint pebbles. This is a dry operation and the mill is in closed circuit with a Hardinge Superfine classifier. The pulverized product is settled out of the air stream by cyclones and loaded into bags. When pebbles are processed they are hand-picked before shipment.

A view of the company's flint-pebble processing plant at Glidden, Texas.

Sand-blasting and filter sands are fed to a 3- by 40-foot rotary drier. A bucket-elevator discharges the dried sand on a tandem 3- by 10-foot Tyler Hum-mer 2-deck screen from which the product is discharged into railroad cars.

Filter gravels are received in cars or trucks from which they are discharged into a track hopper. A belt-conveyor feeds this material to a 2- by 10-foot Tyler Niagara 2-deck screen. The finished products are either bagged or loaded direct into cars in bulk for shipment.

All these operations are under the general supervision of F. J. Cloud, who is vice-president of the W. R. Bonsal Company and president of the Southern Products & Silica Company. W. J. Cobb is manager of all the latter company's operations.

Crusher Weld *(from page 79)*

welding operations should the casting become so hot that the man connot hold his hand within six inches of the section being welded.

After the fracture was repaired, the owner decided to apply vertical corrugations on the mantle for more efficient handling of large rock. These corrugations were formed by applying ⅜-inch Amsco nickel-manganese steel filler bars longitudinally on the lower face of the mantle, filling in along the sides of the bars with nickel-manganese welding rod and depositing two layers of Amsco Economy Hardface over the corrugations. The Hardface, which has a Brinell hardness of between 450 and 550, withstands the initial wear, thus allowing the manganese steel beneath to work-harden, with a consequent longer service life after the Hardface is eventually worn away. Figure 5 shows the crack in the mantle completely welded, and one of the corrugations.

To weld the fracture proper, including reinforcing the casting on the back side, 75 pounds of welding rod was used, and 36 man-hours were required for the job. The cost of reclaiming this large casting was only a small fraction of that of a new mantle, but it should also be noted that 14,000 pounds of casting metal was saved.

Ships Named for Men Prominent in Cement, Concrete Development

THE reinforced-concrete, self-propelled cargo ships being built at the Tampa, Florida, yard of McCloskey & Company represent perhaps the greatest step forward made to date in the advancement of ready-mixed concrete. The fact that these ships compare favorably in strength, seaworthiness, watertightness, cost, and efficiency with steel ships indicates more clearly than ever before that modern concrete must now be classified as a structural material with known characteristics which can be adapted to meet a wide variety of requirements. An article published in the July, 1944, issue of PIT AND QUARRY and THE CONCRETE MANUFACTURER told how this concrete is designed, mixed and placed.

The importance of this latest achievement of concrete is indicated by the fact that the ships are being named after men, now deceased, who were active in the development of cement and concrete. To date 21 ships have been launched. They are listed in the order of their launching and a brief biography of each individual is given. The number preceding each name is the shipbuilder's hull number.

1. VITRUVIUS

Vitruvius (Marcus Vitruvius Pollio) was the concrete engineer for Augustus Caesar during the "Golden Age" of Roman construction of public buildings and aqueducts. Bramante, Michelangelo, Palladio, Vignola, and earlier architects were careful students of the work of Vitruvius.

2. DAVID O. SAYLOR

First to manufacture Portland cement in the United States, at Coplay, Pennsylvania, about 1872. Developed the American cement industry during its earliest years.

3. ARTHUR NEWELL TALBOT

Born October 21, 1857; died April 3, 1942. Professor Emeritus, University of Illinois; famous for his studies in reinforced-concrete design and construction. He was the first recipient of the Henry C. Turner Medal in 1928 for outstanding contributions to the knowledge of reinforced-concrete design and construction.

4. RICHARD LEWIS HUMPHREY

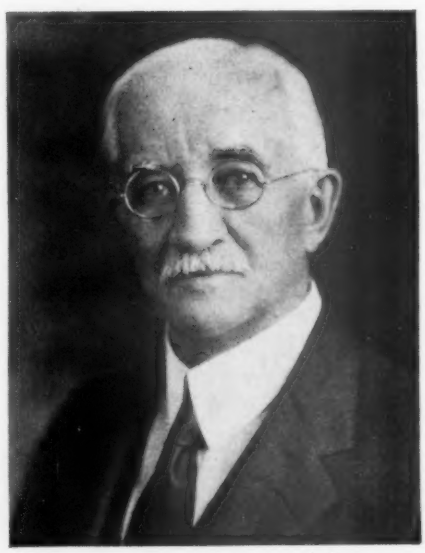
Born October 19, 1869; died November 2, 1928. Very well known at turn of the century. Cement and concrete expert for the United States Geological Survey; consulting expert and engineer associated with the cement-manufacturing industry; member of the War Industries Board in World War I; first president of the American Concrete Institute and life-long active member.

5. RICHARD KIDDER MEADE

Born Charlottesville, Virginia, November 28, 1874; died October 13, 1930. Chemist, Edison Portland Cement Company 1902; Northampton Cement Company 1904; founder of publication, *Chemical Engineer,* 1904; director of Meade Testing Laboratory in Allentown, Pennsylvania, 1908-11.

6. WILLIS A. SLATER

Well-known for his work in concrete research while at the National Bureau of Standards on such projects as the Stevens Creek Dam, and the concrete-ship program of the last war. Received the Wason Medal in 1919 for his paper, *Structural Laboratory Investigation in Reinforced Concrete made by Concrete Ship Section, Emergency Fleet Corporation,* presented to the American Concrete Institute. Died about 1936.



Arthur N. Talbot

Willis A. Slater

7. LEONARD CHASE WASON

Engineer, born August 5, 1868; died April 30, 1937. President, 1895, Aberthaw Company, specializing in reinforced-concrete bridges, mills and residences, the Harvard Stadium and the largest concrete standpipe for water in the world; president, American Concrete Institute. The American Society of Civil Engineers awarded him the Phebe Hobson Fowler Prize for meritorious achievement in engineering.

8. JOHN SMEATON

English civil engineer, born 1724, died 1792. Credited with being the first to make serious attempts to grapple with the question of the cause of the varying hydraulic properties of different lime cements; built the Eddystone Lighthouse in 1756 to 1759, developing "a cement the most perfect possible to resist the extreme violence of the sea." The lighthouse stood for 120 years; it was removed on account of the undermining of its foundations by the erosion of the underlying rock.

9. JOSEPH ASPDIN

Generally credited with the invention or origination of Portland cement as now used. He gave the name of Portland cement to the artificial cement which he patented in 1824. This cement, as he originally prepared it, was obtained by lightly calcining a mixture of lime and clay and grinding the product. It was so named because its color resembled that of the chalk cliffs at Portland, England.

10. JOHN GRANT

British. He lived in the nineteenth century and was first to go thoroughly into the question of cement testing. His experiments and re-

searches stamped him as an authority on the subject.

11. H. LeChatelier

Eminent French authority, chemist and theorist on cements. Develped the chemical formulae for Portland cement, establishing minimum and maximum limits of the component parts. Several tests on cements are based on his early work.

12. L. J. Vicat

French, early nineteenth century. His early studies on cement chemistry developed basic knowledge in this field. Modern tests and technical contributions are replete with allusions to his studies and demonstrations; it is difficult to find anything of importance on the subject of cement or concrete which does not make use of his results, or in some way refer to them.

13. Robert Whitman Lesley

Born Philadelphia, Pennsylvania, July 4, 1853; died November 10, 1935. Founded cement firm of Lesley & Trinkle, Philadelphia, 1874. Took out patents on the manufacture of cement. He was an associate of David O. Saylor, and performed an important part in the commercial development and introduction of American Portland cement. He was the first president of the Portland Cement Association.

14. Edwin Thacher

Engineer, born DeKalb, New York, October 12, 1838; died at New York, September 21, 1920. He graduated from the Rensselaer Polytechnic Institute in 1863. He invented and patented Thacher's cylindrical slide rule, improved duplex slide rule, steel bridge trusses, combination bridge trusses, a system of concrete steel arches, steel superstructure for concrete-steel bridges, a bar for reinforcing concete and a system for concrete-steel floors.

15. C. W. Pasley

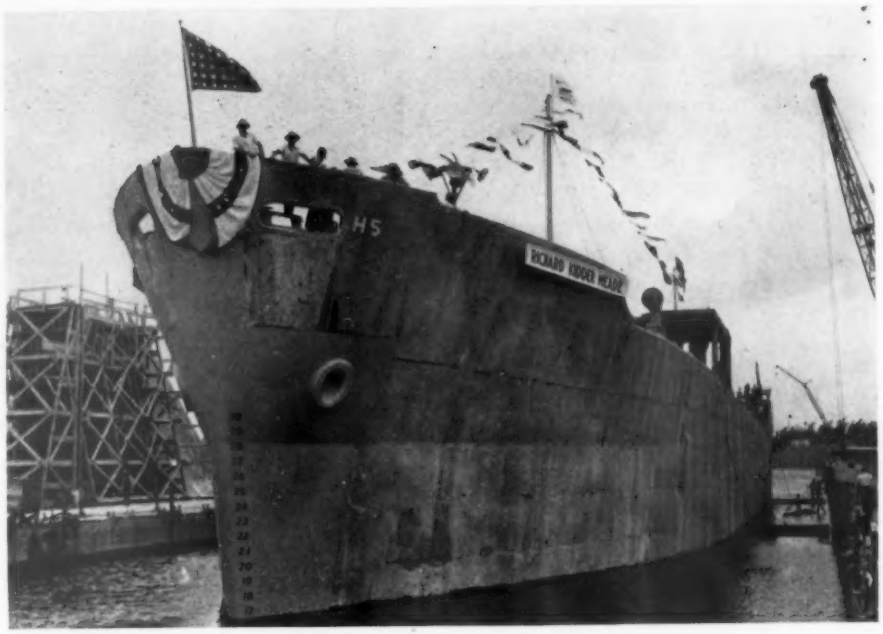
British, nineteenth century. He began in 1828 to investigate methods of improving on natural and Roman cements, trying to produce an artificial hydraulic cement. He worked independently of Aspdin toward the same end, but two years later than Aspdin, and developed tensile-strength testing techniques.

16. A. Considere

Considere is internationally known for his design theories and studies in reinforced concrete. He was one of the early developers of the theory of reinforced-concrete construction.

17. Francois Hennebique

Born in Calais in 1843, died in Paris in 1921. Although he had very little formal engineering education,



Hull of the "Richard Kidder Meade" before being fitted out.

Mrs. James B. McHale christens the "Robert Whitman Lesley" while Mrs. M. H. McCloskey III and her father, M. H. McCloskey, Jr., company president, look on.

Miss Margaret Clark, welder in the sheet-metal shop, elected by the employees as their choice to sponsor the "Richard Kidder Meade," christens the vessel while (left to right) are her matron of honor, Mrs. Nell Siracoe, L. R. Sanford, regional director, U. S. Maritime Commission, and M. H. McCloskey, Jr., company president.

he had an extraordinary knowledge of the practical use of building materials. He first invented the correct use of stirrups in concrete reinforcement, and first used reinforced-concrete foundation piles. He is considered one of the real pioneers in reinforced concrete.

18. Col. P. M. Anderson

Born in Green County, Wisconsin, 1884 and died in Washington, D. C., in 1942. As Lieutenant Colonel in the U. S. Army, he was assigned during 1919 to the inspection of concrete ships. In 1920 he was engaged in the inspection and tests of concrete ships at Norfolk, Virginia. In 1941 he prepared the preliminary designs for the concrete oil barges built at Savannah, Georgia, and Houston, Texas.

19. Albert Kahn

Born in Luxembourg in 1869 and died in Detroit, December 8, 1942. He was an outstanding architect and builder who contributed greatly to the modern skyscraper, and to practical concrete design and construction. He designed and built the mass-production plants for Ford, General Motors, Chrysler, Hudson, and Packard Motors. He also designed numerous naval bases and designed and built more than 500 factories in Russia.

20. Commander Willard A. Pollard, Jr.

Born August 15, 1895; died February 20, 1942. Commander Pollard was responsible for the construction of many important reinforced-concrete projects for the United States Navy. In addition, during the last war he was in charge of the construction of a number of successful reinforced-concrete barges. At the time of his death he was connected with the design and construction of the reinforced-concrete cargo vessels and oil tankers.

William F. Cowhan

Just before the bottle hit the hull, Mrs. Spessard L. Holland, wife of Florida's governor, swings mightily to christen the "David O. Saylor."

21. William Foster Cowham

Born October 1844; died January 1913. William Foster Cowham was a pioneer of the cement industry. He built and operated more cement mills in the United States and Canada than any other individual during the period from 1898 to 1913. His outstanding achievement was the construction of the first electrically-operated cement mill, which, thereafter, profoundly influenced cement-mill construction.

Raise Phosphate-Rock Production Goals

The program for world utilization of phosphate rock, most of which is required for agricultural purposes, calls for the production of 10,000,000 tons in the agricultural year beginning July 1, 1944, and extending through June 30, 1945, while goals for the following year, 1945-46, will be raised to 12,767,000 tons, according to the War Production Board.

Pre-war consumption of phosphate rock was approximately 10,700,000 tons. The increase in requirements for 1945-46 is chiefly for the rehabilitation of liberated European countries, the W.P.B. said.

Phosphate rock mines in North Africa will be expected to furnish a substantial portion of the raw material to be converted into superphosphate fertilizers to meet European requirements, representatives of the Chemicals Bureau recently informed members of the Florida Phosphate Rock Producers Industry Advisory Committee.

Reporting on the condition of mines in Morocco, Tunisia and Algeria, a representative of the North African Economic Board told the committee that the chief bottlenecks to maximum production of phosphate rock were shortages of labor, equipment and railway transportation. In many cases ports have been severely damaged, loading and unloading facilities torn up, and channels filled with obstacles.

Increased production required for the transition period could best be obtained in the United States, inasmuch as production difficulties are more easily surmountable here than in North Africa, the committee said. A recommendation was made by them to the W.P.B. that a survey be made of the Florida phosphate rock industry to determine production potentialities before any quotas be established.

One of Pit and Quarry's subscribers, who manufactures concrete burial vaults, is seeking new sources of mica spars which the company uses in its vault tops. Mica producers who are in a position to supply this type of material are invited to write the Readers' Service Department, Pit and Quarry, 538 South Clark Street, Chicago 5, Illinois, for the name of the vault manufacturer.

1943 Cement Production Reflects Building Drop

The demand for hydraulic cements declined sharply in 1943 as the construction phase of the war program neared completion and structural activity fell rapidly. According to figures just released by the Bureau of Mines, total production of 135,254,054 barrels of hydraulic cements was 27 per cent. below the record set in 1942, a reduction that resulted from respective decreases of 27 and 29 per cent. in outputs of Portland cement and of a grouping of all other hydraulic cements (natural, masonry, puzzolan and hydraulic lime). The rate of operations in the Portland-cement industry was at 55 per cent. and in the "all other" group at 44 per cent. of productive capacity in 1943. Mill shipments fell 31 per cent. below the high annual volume of 1942 and totaled 129,478,662 barrels. Demand for Portland cement, as gaged by shipments, declined nearly one-third and for the group of all other hydraulic cements decreased about one-fourth from 1942. As production exceeded shipments by nearly 6,000,000 barrels, stocks of all hydraulic cements at mills on December 31, 1943, advanced to 23,408,972 barrels or 33 per cent. above the quantity on

(*Continued on page* 89)

The Post-War Needs of the Limestone and Lime Industries

By W. R. CLIFFE

another P and Q exclusive

HOME and furniture which provide a link with our colonial period are a source of pleasure and interest to a great many Americans. For the ordinary purposes to which furniture is put, antiques of the early American period are just as practical and comfortable as modern pieces, and, in addition, they possess a mellowness and charm which are peculiarly satisfying. Much the same may be said of the old homes which are rebuilt in an attempt to preserve or to recapture that same atmosphere. The results in many instances are at once attractive and gratifying. But who can claim that such dwellings, regardless of their charm, compare in completeness, efficiency, and compactness with homes which take full advantage of all that is latest and best in mechanical and architectural development?

No one ever heard "charm" advanced as a justification for the existence of a stone or lime plant, yet a rough estimate indicates that approximately *ninety* per cent. of the limestone and lime plants of the United States may be classified as members of the antique group.

With few exceptions, limestone and lime properties have not been substantial money-makers. Most of them obtain for their owners a bare existence. Dividends are the exception rather than the rule. The lime industry, more than most industries, has failed to keep pace with modern developments. It is a veritable Rip Van Winkle that has not yet awakened. But the survival of lime as a major industry in the post-war era is dependent upon its ability to face the facts, shake off its lethargy, and critically examine modern developments in many fields which will lead to increased output and decreased unit production costs.

It is true that many properties are busier to-day than ever before but there is no guarantee for the continuance of such activity. Much was heard ten years ago about "turning the corner". The end of the present conflict will bring us to another corner which must be turned, and the turn will bring the industry face to face with post-war competition which probably will be of unimagined intensity. In meeting this competition there is no standard set of rules which is applicable to the entire industry. Each producer must analyze his own problems and determine upon his own procedure.

Experience indicates that most executives in the industry have been so close to their own individual difficulties in recent years that they have failed to give due consideration to the latest improvements in equipment, control, instrumentation, and technique. For this reason a number of phases in the production cycle are listed herewith for consideration in making an analysis of modern developments as they apply in the limestone and lime industry.

Surface Protection Property adjacent to rock deposits should serve some useful purpose. Normally it should be either farmed or forested. Forestation, particularly the planting of pines, has a dual advantage. The reduction of erosion produces almost immediate benefits, while at a later date a cash income may be expected from the planting in the form of saleable Christmas trees when thinning at the end of about six years and for several years thereafter, and finally from a crop of saleable timber at the end of about forty years.

Such planting should be laid out carefully by a field party with instruments to obtain the best results from the standpoint of both beauty and utility.

Quarry Stripping Stripping has defied complete mechanization more than any other phase of quarry practice. This step is of such importance that it is difficult to overestimate the importance of careful overburden removal.

Regularity or irregularity of terrain, type and depth of overburden, nature of outcrop formation, and other similar factors govern the determination of the method of stripping most suited to the individual site.

Where the rock formation affords a horizontal top surface, the cover may be removed readily, rapidly, and cheaply, by using tractor-drawn scrapers, elevating graders, or similar equipment.

In some very rough terrain "topping" removal is best accomplished by employing hydraulic methods. Where conditions are suitable this is one of the cheapest and most effective methods.

Where the overburden is heavy and the outcrop rough, as is often the case, the dragline furnishes the most effective method of removal. Quarries having power shovels equipped with long booms, fair-leads, and buckets are adequately equipped to employ this method. Where such equipment is not available the stripping operation may be done with a hired machine, in which case several years' rock requirements should be stripped when the machine is available. It is strongly recommended that the necessity of renting such a machine be avoided by the purchase of the needed equipment, since, in addition to being useful in stripping operations, this same equipment will find many additional uses around the plant once it is available.

Of course, the final removal of earth, clay, and similar material from the crevices of the outcrop must be effected by hand methods usually involving the use of hoist-lifted buckets or boxes.

It is a well-known fact that earth, clay, and the like can be removed in such preliminary operations, on the surface for about one-quarter of the cost involved when it is allowed to contaminate the pile of broken rock in the quarry.

Efficient and thorough stripping operations constitute the most effective start towards low quarry costs.

Initial Drilling The decision to purchase new drilling equipment is apparently very difficult for many quarry operators. As a result most of the well drills used in limestone quarries to-day are at least twenty-five years old. Many of them are old steamers that have been converted to use electricity or gasoline. And this condition exists despite the fact that drilling equipment has been improved to such an extent that the cost of a new unit would be dissipated quickly by increased footage and decreased labor and maintenance costs. Similar improvement may also be noted in bit design.

Superintendents who keep accurate footage records can convince themselves of the desirability of the modern equipment by comparison between the results obtained by the use of both types. Those who have failed in the past to keep adequate records should profit from the example of those who have done so when the time comes to modernize the drilling equipment.

The location of the drill holes for "the next shot" is also a matter which should receive more consideration than is usually allotted to it. Too many quarry operators have been content to leave the matter of the location of the holes to the drillers. In following this line of action they fail to take advantage of the great reservoir of technical knowledge that has been accumulated by the manufacturers of explosives.

Explosives manufacturers willingly place their knowledge at the disposal of quarry operators upon request. Certainly they want the producer's business, but they are a progressive type of business men and will assist the producer in laying out a set of holes which will have definite advantages from his point of view. While it is not always possible to obtain optimum results the first time, continued coöperation with the manufacturers will put the experience of their organizations at the producer's command, and will pay dividends in ultimate efficiency in this important phase of production.

Consideration for the cost involved should be a primary factor in determining the height of quarry faces. Despite this fact, many operators have failed to consider the advisability of altering the height of the quarry face to bring it within the range of the wagon drill, which is the fastest, most economical machine of its kind that has ever been developed. The economies that may be effected are many and important and may justify radical changes in drilling methods.

Furthermore, the proper type of drilling and hole-spacing can have an important effect upon explosive requirements, shoveling, transportation, and crushing.

Selection of Explosives It is wise to review the type of explosive used in initial blasting if this phase of the operation is to be developed to the highest point of efficiency.

Few industries spend as much money for research as our leading explosives manufacturers, and as a result improvement in the safety and effectiveness of their products is continuous. Their technical representatives will apply proved formulas to the producer's blasting problems on request. While these formulas may not achieve perfection in their first application they will prove far superior to the rule-of-thumb procedure in most frequent use and will ultimately achieve better blasting results than those which most plants have been accustomed to accept as satisfactory.

The manufacturers will probably recommend the use of more stemming and less dynamite, they will stagger the loading, using fast powerful gelatine where necessary and ammonia-base powders in the right place, and in addition they will handle the explosives more safely and surely. The recommended detonating arrangement will be of a type that will minimize "lost holes" and worse. And the net result to the operator will be no toe, more rock per pound of explosive, better fragmentation, less secondary drilling and shooting, better shoveling, less maintenance on haulage equipment and crushers, and faster crushing.

If good practice in primary drilling and blasting is employed the business of handling becomes comparatively simple and it is obvious that nothing can contribute to low unit production costs in greater measure than economical handling.

Secondary Drilling and Blasting Modern improvements in jackhammers have produced a lighter tool with less vibration and a greater cutting speed. A practical test of a new jackhammer will soon convince plant operators of the desirability of replacing old secondary drilling units with the newer ones.

Air hose has been lightened and toughened so that it will better withstand the rough usage to which it is sure to be subjected on the rock pile. For such use the best hose is none too good.

Line oilers have been greatly improved and they are essential to the longevity of jackhammers.

While there is considerable adverse sentiment regarding the use of detachable bits, "the people who keep accurate cost data" have with very few exceptions adopted them. This fact speaks for itself. But if doubt as to the advantages accruing from the use of detachable bits continues, a fair trial conducted with an open mind will convince even the most skeptical that more and faster footage is obtainable with this type of equipment. In this connection it should be remembered that if the trial is placed in the hands of a prejudiced old-time quarry man the best results can not be expected and the trial will not give the equipment a fair chance to prove itself.

Another suggestion in this connection is that the bit gage should be kept down. No more hole footage should be drilled than is absolutely necessary. For so-called "block holing" a 1¼-inch bit is plenty, with 1-inch ammonia-base dynamite for the shot. A firm stand must be taken against overshooting. While there are some instances, particularly in underground-mining practice, where undershooting may prove very costly, this is definitely not the case in secondary blasting where a failure is relatively unimportant. It will be hard work to drive this point "home" to the ordinary quarry man but the savings that will accrue will be well worth the effort.

Rock Loading There are still a number of the old railroad-type steam shovels and many more obsolete types of full-revolving shovels loading rock in the limestone quarries of the country. As a general rule, pit organizations assume the tempo of the loading units. In most cases where old equipment is used this tempo is slow enough to assure high quarry costs.

The difference between the old heavy, rugged, slow "quarry-type shovel" and the modern Diesel-electric units is amazing. And yet these modern units are designed to stand up to the grueling business of loading rock and will do it day in and day out at a fraction of the maintenance cost of the more antiquated equipment.

If the operators can take away what these new loaders can handle the whole tempo of the pit will be speeded up to a remarkable degree.

Quarry Transportation Only a few operators continue to lay tracks in their quarries and haul the rock from the shovels to the crushers in cars. Ex-

cept where the haul is excessively long, this practice has been proved to be uneconomical.

Many operators, who have abandoned railway transportation, are trying to solve their rock-transfer problems with motor trucks of standard design. While this practice may be superior to the use of a railway system, the ultimate in speed, mobility, and low maintenance will not be obtainable in many cases until Diesel-powered units especially designed for the transportation of heavy loads of rock are acquired.

Modern drilling, approved explosive practice, shoveling, and transportation, in combination, will serve to increase the production rate and reduce unit costs to a greater extent than is obtainable by the modernization of any other section of the production cycle. Furthermore, the acquisition of the necessary modernized units and their installation need not interrupt production in any way, and this is the only point in the cycle at which modernization without interruption can be accomplished.

Crushing Many of the primary breakers that were built twenty-five years ago have all that is needed to hold up their end under an accelerated production schedule. Most breakers of this type have far more capacity than is ordinarily utilized. And it is good that this is so, because the suggested improvements that precede the crushing phase will undoubtedly make it necessary to utilize the entire reserve capacity of the crushers.

Efficient primary crushing can be obtained best by constant feeding. This is possible only when surges are eliminated and the rate of crushing is maintained until the next hauling unit arrives at the receiving hopper. Well-designed receiving hoppers served by ruggedly built rock feeders are essential if a constant feeding rate is to be maintained.

The greatest advance in the crusher field has taken place in the secondary or recrusher type of installation. The capacity of these modern units with built-in synchronous leading-power-factor motors will amaze the plant man who is unfamiliar with them.

The possibility of needing to meet the demands of a general speed-up combined with a reduction of the work week to 40 hours makes it imperative for all operators to review their crushing facilities with a view to eliminating all possible "bottlenecks" in this phase of operation.

Screens The old trundle screen has served its time and has been almost universally replaced by the vibrating or shaking screen.

Despite this fact, an enormous number of vibrating screens now doing duty in plants all over the country have been poorly chosen and consequently are not giving the type of service which could ordinarily be expected from the right screen in the right place.

The responsibility for this fault lies chiefly with the plant operators. When discussing his requirements with the representative of a screen manufacturer, the plant operator seldom knows the size range of his stone when it arrives at the screen, what he wants in the way of separation, and the tonnages involved. More often than not the representative is given some general information upon which to base his selection, and the result is usually a screen which is not properly adapted to the job required of it.

Careful consideration must be given to every detail when a screen is being selected. Proper choice will result in an efficient, low-cost unit which will function for days on end without attention. If immature thought is applied at the time of selection the reverse will probably be true.

Washing Equipment Most of the equipment involved in the washing of stone is highly specialized in character and requires careful advance study. Scrubbers are of paramount importance in this phase of operations and are usually designed to suit local requirements.

Great improvement has been made in recent years in log-washers. These are probably the most effective device for the removal of undesirable substances from crushed rock. Modern design incorporates increased capacity, minimum wear and power consumption, and maximum effectiveness.

Screenings washers, dewaterers, launder plates, wet screening, and similar operations are all matters for local consideration. No general suggestions can be offered in connection with these phases of operation.

Lubrication Lubrication is, in itself, an economical practice. Since its objective is to decrease the wear on moving parts and to guarantee a smooth flow in the producing units it can not be disregarded. The finest lubrication practice is none too good and it may well be said that no lubrication program is too expensive. Of course waste, sloppiness, and misuse are too expensive, but these items are not a part of any lubrication program.

Quarry and plant lubrication, when practiced at all, are usually ill-advised and wasteful. In most limestone operations there is twice as much lubricant on the floor as is required to oil the equipment.

Plant operators will derive a great deal of satisfaction from the study and installation of a good lubrication program. There is a wide assortment of lubricating accessories, which, if properly installed and serviced, will give better lubrication at reduced cost wherever lubrication is required. Money spent intelligently in this respect will be repaid many times in reduced maintenance costs.

A few suggestions in connection with the lubrication program are:

(1) Choose only good lubricants; often the most expensive will effect the greatest saving.

(2) Standardize in so far as possible so as to use the smallest possible number of types of lubricants.

(3) Remove all the oil from its original containers and place it in approved dispensary equipment.

(4) Standardize grease fittings wherever possible and specify them when ordering new equipment.

(5) Select the man responsible for lubrication with care and give him careful instruction in the details of his job. The proper man for the job should understand the functioning of machinery and should be capable of making a study of the amount and frequency of service needs. This is not a "soft spot" for a pensioner or for some employee who has failed to fit in at several other spots in the plant.

Power Limestone quarries are heavy power consumers. The charges incurred for the use of electrical power constitute a considerable item in the calculation of production costs.

In this connection the following suggestions should be considered by operators who are interested in reducing the cost of electrical power:

(1) Representatives of local electric companies should be consulted in an attempt to place the operation on the best and most economical possible schedule.

(2) Means for improving the load and power factor should be thoroughly studied.

(3) The use of synchronous motors with eight ratings and capacity banks for power-factor improvement should be considered.

Dust The problem of dust in lime plants is one which has been disregarded too much by plant oper-

ators in the past but it seems certain that increasing pressure will be brought to bear in order to minimize the ill effects of this evil.

While such pressure may react on some operators as another imposed burden which will increase the cost of production, forward-looking producers will consider the good effects —better functioning of equipment, increased efficiency of workmen, development of public good-will—which will be attendant upon the reduction or elimination of dust.

The cost of a dust-reduction program is not so great as might be expected, and the products collected will be salable at interesting prices, resulting in an appreciable reduction of the net cost of the program. Planning for the installation of a dust-reduction program should begin now.

Store-Room Facilities An efficiently organized storeroom is of fundamental importance in the production of lime. And yet the majority of organizations operate under almost unbelievably ineffective conditions in their handling of operating supplies, small tools, spare parts, and similar necessities.

The planning and operation of the storeroom should be the subject of careful consideration, since its proper handling will expedite plant operation and result in a general decrease in small-stores expenditures.

The following suggestions are pertinent in the organization of storeroom facilities:

(1) The purchasing agent's office should be located in the storeroom.

(2) The storekeeper should be wide awake, efficient, and capable of independent thinking. His personality should be in keeping with the demands of his job.

(3) A standardized system of perpetual inventory should be installed.

(4) A check system should be set up for the issuing of small tools and similar equipment.

(5) Nearly all small equipment and expendable materials should be under the cognizance of the storeroom keeper. He should have charge of dispensing all fuels and lubricants, issuing special working clothing and small tools, providing small parts for repair purposes, and so on.

(6) The storeroom should be equipped with steel bins, cabinets, lockers, and oil-dispensing equipment for classification of equipment to facilitate rapid deliveries.

(7) The time department, truck-repair section, blacksmith shop, machine shop, truck scales, and laboratory should be adjacent to the storeroom and provisions should be made to have the air-compressors and welding outfits in the near vicinity.

It will be noted from the above suggestions that the storeroom is visualized as a nerve center for operations. As such, it will play a part almost as important as that of management. A storeroom keeper who is competent to handle stores in the manner outlined will have to be a good man and will deserve good pay, but he will save more than the amount of his compensation in the reduction of lost time and tools.

Organization The old-timers in the quarry and the plant are the backbone of the lime business. But in many cases an injection of modernism is prescribed. If educational facilities for this purpose are not available in the immediate vicinity of the producer's plant, he should communicate with the state university. In all probability it will be glad to coöperate in achieving the desired end.

Recognition should be given to the desirability of bringing "new blood" into the organization. Before very long there will be large numbers of intelligent young men leaving the armed forces and searching for jobs. While they may not be quarry men, a little time spent in the right atmosphere will give them a chance to develop and they will fit into a spot in the organization with very satisfactory results.

Laboratory Control In the period ahead it will become increasingly important to exercise laboratory control over lime products. They will have to be guaranteed both physically and chemically. To maintain such control every lime plant should be provided with a compact, well-equipped laboratory under capable supervision.

Work Week Under the pressure of war production it has been possible to overlook the additional expense involved in overtime rates. But in the post-war period the industries of this country, handicapped by overtime rates, will find themselves in a precarious situation created by competition from abroad.

It is therefore essential that every plant director begin now to plan his operating procedure on the basis of a 40-hour week. This will involve stone-stocking, which is not without its difficulties, but the problem will have to be faced and a cheap solution devised. Only by the avoidance of overtime pay can competition based on the low wage structures of foreign countries be met successfully.

It is inadvisable at this time to predicate any post-war plans on the probability of a reduction in our wage structure. Plans made on such an assumption will probably have to be reconsidered at considerable cost in time and money.

Labor The limestone industry can profit from the results of training which have been amply demonstrated by both the Army and the Navy during the present war. There remains no question that men can be trained to perform specialized jobs quickly and efficiently.

The efficient operator will no longer turn his men loose on a job to shift for themselves. Such a procedure is inefficient and expensive. The establishment of a training program will be a function of management, and employees must be thoroughly familiarized with the nature and requirements of their jobs and be trained for efficient production at the spot to which they are assigned.

Furthermore, operators will do well to recognize the fact that labor will no longer do hard manual work. Means for minimizing laborious effort must be found. The presence of so-called "dirty jobs" will always be a sore spot and the wise plant and quarry manager will do well to recognize the fact and eliminate them.

Types of Kilns For more than twenty years the difficulty involved in the marketing of anything other than rotary-lime-kiln products for chemical and industrial purposes has become increasingly apparent. This statement, accepted by rotary-kiln operators and rejected by operators of vertical and mixed-feed kilns, does represent the true condition and will in all probability become increasingly obvious.

For many years prior to the beginning of the war there was a vast overproduction of lime. Operators could not visualize an eventuality which would tax their capacity. But the situation ultimately became so acute that, even with many old kilns in the process of abandonment brought back into production, the demands of industry could not be met. Cement kilns in hard-pressed areas have been converted but the experience has not been wholly satisfactory and most cement operators will probably be glad to reconvert as the demand slackens. Still further falling off of demand will be accompanied by the final abandonment of

much vertical and mixed-feed kiln equipment.

Operators of short rotary kilns face a real problem in making their equipment economically satisfactory for post-war conditions. But the demand for rotary-kiln lime in preference to other types offers them a chance for survival despite the fact that the fuel costs of rotary kilns have been higher, until comparatively recently, than those involved in vertical-kiln production. Short-kiln operators should take advantage of modern progress in lime-burning technique.

This advancement, with its consequent reduction in B.t.u. requirements, is not the result of any particularly important single factor but rather the result of the combination of a number of individual improvements in the efficiency of equipment, in control, and in the quality of production.

Some of the items which should be considered by the short-kiln operator who is attempting to reduce fuel costs are:

(1) Improvement of calcining conditions through coal fineness.
(2) Correction of primary-air temperature and control.
(3) Correction in secondary-air temperature and control.
(4) Improvement in instrumentation.
(5) Uniformity of feed.
(6) Improved draft control.
(7) Refractory improvements.
(8) Increased heat utilization through the use of insulation, exit-gas utilization, and the like.

Even the use of all the available improvements may not give the thermal efficiency of complete new installations, but it *can* approach it, and, with the outlook for rising fuel costs, improvement of the fuel ratio is vitally important.

The output requirements of many vertical and mixed-feed installations do not justify their replacement with rotary kilns because of the capital outlay involved. Where such is the case, there are available modern calciners with a capacity of 10 tons of lime daily which can be erected in batteries to provide the capacity required. These calciners, which will produce pebble lime equal in quality to the rotary-kiln product with a fuel ratio equalling that of the most modern installations, are of the continuous type and are practically automatic, in addition to which the cost per daily ton of output is only about one-half that required for the installation of a rotary kiln.

Vertical and mixed-feed operators should give real consideration to the installation of such units when planning their post-war program.

Lime-Plant Equipment Items which should be of particular interest to lime manufacturers in their planning are *improved* types of:

(1) Dust-recovery systems in wide capacity ranges.
(2) Mechanical bag loaders.
(3) Pebble-lime valve-bag packers.
(4) Mechanical air-separators.
(5) Pelletizers and briquetting equipment.
(6) Autoclaves for the pressure hydration of dolomitic limes.
(7) Air-transport systems.
(8) Locker, wash-room, and toilet facilities for plant employees.

The installation singly or in groups of the items listed above will not necessarily result in an appreciable reduction of unit production costs. But they are worthy of consideration in the development of a general improvement program which has as its objective the reduction of costs to a point at which post-war competition can be met with some degree of assurance.

In addition to the points mentioned above it should be pointed out that in many cases the buildings and general lay-out of lime plants are not suited to the production of lime products. New and progressive "blood" has entered the field with the conversion of cement kilns to lime practice, and this fact, combined with the probability of foreign competition, will sooner or later result in an intense struggle for post-war markets. The lime and limestone industries will do well to analyze their individual shortcomings seriously with a view to initiating an intelligent improvement program so that they may enter the period immediately ahead with confidence.

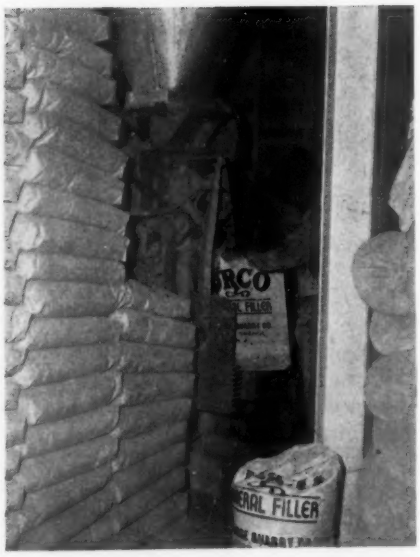
Cement *(from page 84)*

hand at the close of 1942. During 1943 no adjustments were made in the permitted maximum prices for cement which had been frozen at the levels of March 1 to 15, 1942. The average net mill realization per barrel of Portland cement increased 4 cents over 1942 to $1.57 in 1943, whereas that for the all-other hydraulic cements group dropped 18 cents to $1.28 in 1943.

The declines in output and mill shipments of cement in 1943 were less severe than the falling-off in construction activity owing to the continuation of the uptrend in demand for cement into the beginning of 1943 while structural activity was declining. Total new construction activity in 1943, as estimated on a value basis by the Department of Commerce, was off 42 per cent. from 1942. Residential-building contracts awarded, according to Dodge Corporation data for 37 eastern States, declined 52 per cent. and contracts for all other construction were 63 per cent. below the corresponding awards in 1942. Contracts for engineering construction, as reported by *Engineering News-Record*, fell two-thirds below the 1942 value. The volume of construction that was contracted in 1942, but did not consume cement until in 1943, was indicated by the Portland Cement Association's data on concrete paving contracted and completed. In 1943, contracts were awarded for 71,089,671 square yards, whereas a total of 93,650,221 square yards were completed. Concrete paving completed at airports in 1943 represented slightly more than two-thirds of the total and was only 20 per cent. below the record area of 1942. Road, street, and alley paving declined 35 per cent. from the yardage completed in 1942.

Cement producers in all sections of the country reported labor shortages, high rates of labor turnover, and sharply increased costs of production. Wage-earner employment, according to the Bureau of Labor Statistics, in January 1943 was 115.0 per cent. of the 1939 monthly average and declined steadily in each month to 87.7 per cent. in December. As a measure of the increased labor costs resulting from wage increases and overtime rates of pay, the index of wage-earner pay rolls in 1943 was 141.2 compared with 100 in 1939. The monthly indexes (1939 monthly average—100) ranged between 149.9 in January and 127.4 in December. Increases in basic wage-rates were reported by some producers in Pennsylvania, West Virginia, Ohio, Illinois, Tennessee, Missouri, and California; the reported increases ranged from 2 to 5½ cents per hour. Labor costs were raised considerably by the overtime rates of pay at the many plants that operated on a 48-hour work week in place of the former 40-hour week as a means of solving the labor shortage or of holding current labor forces. Fixed production costs per barrel of output, such as capital investment and plant depreciation, mounted rapidly in 1943 as the volume of production fell with the declining demand for cement. Other factors that increased production costs were the rising costs of fuel, supplies and repair parts.

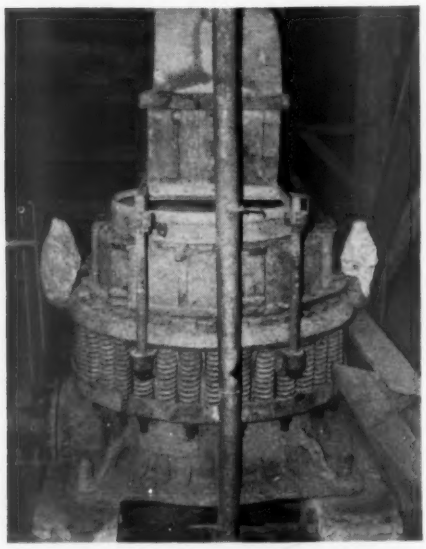
Dust-collectors at the Orange Quarry plant with fan buildings and air intakes.



View of bagging operation, now suspended due to labor shortage.

Vibrating screen showing partial coverage by hood.

Vibrating screen with entire deck covered by metal dust hood.



Cone crusher with dust hood and pipe above.

Vibrating screen fully inclosed by plywood panels.

Side view of the dust-collectors showing screw-conveyors below hoppers.

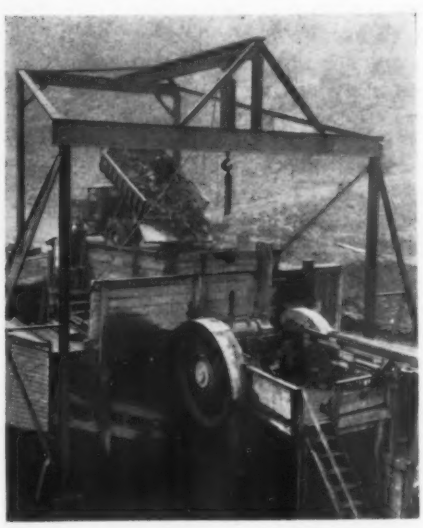
Dust-Collectors Pay Dividends At Orange Quarry Company

General view of the Orange Quarry plant with the primary crusher in foreground.

another ON THE SPOT report

THE Orange Quarry Company at West Orange, New Jersey, provides an outstanding example of the benefits that may be gained from the operation of efficient dust-collector systems. In 1938 this company, which manufactures mineral filler for the paint industry, installed a dust-collector for the recovery of finely pulverized material produced in some of its crushing and screening operations, and the results so far exceeded expectations that the following year saw the installation of another collector of equal capacity to extend the recovery system over the entire plant.

It is noteworthy that these installations were made for the sole purpose of recovering a valuable, finely pulverized material that had formerly been wasted; the abatement of a considerable dust nuisance was a purely incidental benefit, although perhaps by itself a sufficient one to have justified the expenditure involved. The complete success of the first objective may be judged from the rate of recovery: about 12 tons per day on a daily production of 1,500 tons. Since the collectors were placed in operation this entire amount has been sold to the paint industry as mineral filler under the trade name Orco.



Diesel truck dumping to the primary crusher.

Diesel shovel and truck in the quarry.

The company is quarrying an inert rock that analyzes about 51 per cent. silica, 15 per cent. alumina, 11 per cent. calcium carbonate, 6 per cent. ferrous oxide and 8 per cent. magnesia. The recovery is accomplished by a 1½-cubic-yard Lorain Diesel shovel which loads two 15-ton Sterling Diesel trucks equipped with Easton rock bodies. The dust-recovery system starts at the 36- by 48-inch Farrel Bacon primary jaw crusher, and from that point on all the equipment is hooded over or inclosed to prevent the escape of dust.

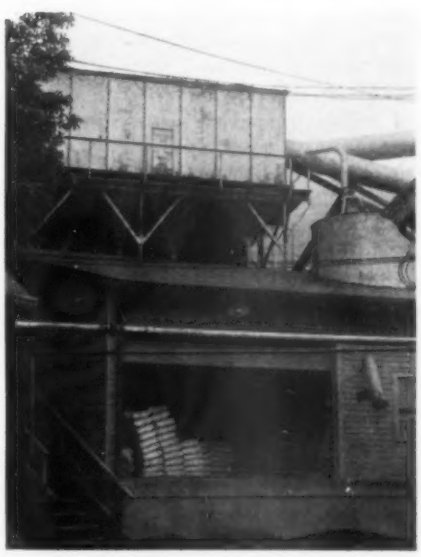
From the primary crusher the material travels by a belt-conveyor to a scalping screen which divides it between 4-foot and 4½-foot Symons cone crushers. The stone is sized on a 6- by 20-foot 3-deck Symons vibrating screen, from which the larger sizes drop directly into bins. The smaller material is re-sized on a 6- by 10-foot 2-deck Tyler screen to complete the division into seven primary sizes ranging from 2½-inch to fine screenings in addition to the filler. Some of the material goes directly to the storage yard in trucks.

By WILLIAM M. AVERY

The two dust-recovery units—one of Sly and the other of Parsons manufacture—are located side by side, about 25 feet from the crushing-and-screening plant, and each has its blower fan individually housed.

Link Belt screw-conveyors located under the units advance the recovered material to a hopper through which it flows by gravity and is loaded in bulk in trucks. The natural ground elevation of the yard has been employed to advantage by locating the bagging building on a level some 20 feet below the recovery plants. The product was formerly bagged in a St. Regis bagging machine, but labor shortage has made it necessary to abandon this practice until after the war. Shipments are at present being made in bulk.

The Orange Quarry Company, which started operations on its present site about 40 years ago as the Eagle Rock Quarry Company, rents space on its property to two other concerns producing ready-mixed concrete and an asphalt product. The quarry supplies the aggregates used in these operations.



View of one of the dust-collectors. Product is loaded in the foreground.

Current and Post-War Problems Reviewed by Sand, Gravel Men

AT the regular midyear meeting of the board of directors of the National Sand & Gravel Association in Chicago on August 16 the problems that weigh most heavily on the industry were thoroughly discussed. The relations of members with various government agencies and their obligations with respect to wage and hour requirements, price control and the like were subjects of major interest.

President Robert Mitchell (Consolidated Rock Products Company, Los Angeles) in his statement to the board dwelt on the post-war public-works program, its obligations as well as its opportunities. He urged those present to provide some sort of leadership in their respective communities and states with regard to returning war veterans and not to leave politics to the politicians. He spoke in very definite terms of the value of the national association to sand-and-gravel producers in his state and, based on their experience with the organization, asked members to bring their problems to the association for assistance.

Executive Secretary Vincent P. Ahearn spoke briefly on the arrangements for the 1945 convention in New York next January and reported on the wide approval given to the 1944 program and the increasing opportunities provided for round-table discussion. Machinery manufacturers, he said, had expressed satisfaction with the arrangements which have been decided upon in the absence of equipment exhibits.

Stanton Walker, the association's director of enginering, discussed at some length the specifications embodied in the *Guide Specifications and Recommended Practices for Concrete Covering Civil Works Construction,* issued August 1, 1944, by the Corps of Engineers of the Army and known as Circular 3205. These require that fine material be graded so that from 12 to 30 per cent. will pass the 50-mesh screen and from 3½ to 10 per cent. will pass the 100-mesh screen. He compared these requirements with those of the American Association of State Highway Officials, which call for a minimum of 10 per cent. passing the 50-mesh screen and a minimum of 2 per cent. passing the 100-mesh screen. For slab work the A. A. S. H. O. requirements provide for 5 and 0 per cent. respectively. Committee C-9 of the American Society for Testing Materials requires that 10 per cent. pass the 50-mesh screen and 2 per cent. the 100-mesh screen.

The speaker said that the Illinois State Highway Department had reported that only 25 per cent. of the aggregates-producing plants in Illinois can furnish material meeting the state specifications, that another 25 per cent. of them could meet them by changing their processing equipment (having the necessary fine material in their deposits), and that 50 per cent. of the plants can not furnish material that will comply with the requirements. He pointed out that the use of air-entrained cement may relieve to some extent the pressure for increased percentages of fine material.

Some producers told briefly of the methods they had adopted to provide the required percentages of fines. Roll-crushers and hammer-mills were mentioned most frequently as the equipment used, the grinding being done wet in some cases and dry in others. One producer reported on the making of traction sand (minus-⅛-inch to 80-mesh) from pebble gravel by the use of a Stedman disintegrator.

At the lunch which followed the members experienced two surprises. One was the presence of Frank W. Renwick of the Chicago Gravel Company, and the other a speech on the bill for federal-aid highways (HR 4915) sponsored by the A. A. S. H. O. Mr. Renwick, who was one of the pioneer producers of gravel in the Chicago area and a former president of the association, had not been present at many meetings in recent years and was enthusiastically welcomed by those present, most of whom had known him for many years.

Sam Hadden, member of the state highway commission of Indiana and president of the American Association of State Highway Officials, spoke forcefully on the need for action in getting the Congress to adopt a sound federal-aid highway bill, as there was grave danger that the bill proposed by his organization would not be acted upon by the present session and would be allowed to carry over to the session opening next year.

The bill for which he was urging support provides $500,000,000 each year during the first three years following the end of the war to be matched by state funds: 40 per cent. by the states and 60 per cent. by the United States government the first year, and equal percentages by both in the second and third years. The old formula for apportioning the expenditure of the resulting funds, in effect since 1916, provides ⅓ according to population, ⅓ on the basis of state area, and ⅓ on the basis of the mileage of post roads in the state. The new formula, proposed by HR 4915 and known as the "Executive Committee Formula," allots ½ on the basis of population, ¼ on the basis of state area, and ¼ on the basis of post-road mileage. Forty-five states, he said, have agreed to support the A. A. S. H. O. plan, but a few states, notably Connecticut and Massachusetts have refused to do so.

The present bill differs from the one originally proposed by the A. A. S. H. O. in that the latter asked for an annual appropriation of $1,000,000,000 and an allocation ratio of 75 per cent. federal and 25 per cent. state in the matching of funds.

Mr. Hadden said that careful surveys reveal that the country is in need of $11,000,000,000 worth of highway construction now, and that this need is growing daily. Action is needed, too, to prevent the diversion of funds collected from highway users from the purposes for which they were collected to other-than-highway uses. Fourteen states, he pointed out, have outlawed gasoline-tax-fund diversion to other uses by means of constitutional amendments, but the federal government remains a serious offender in this respect since of the $672,000,000 it collected from highway users in 1942 less than ⅕ was returned in the form of federal aid. HR 4915 provides for an annual expenditure by the federal government of less than the amount collected by it in the form of automobile use and gasoline taxes, so no additional appropriations, which might be construed as federal subsidies, need be granted.

In spite of the fact that a much better highway system is needed for national defense, since our present system is inadequate to meet the needs of defense in the event of invasion, certain interests are opposing the passage of the bill, believing that their corporation taxes will not be decreased if the proposal should become a law. The petroleum industry and the American Farm Bureau Federation were said by Mr. Hadden to oppose the bill on these or similar grounds.

On the subject of price relief President Mitchell and Executive Secre-

tary Ahearn reported on the action taken by producers in Los Angeles which resulted in the granting by the Office of Price Administration of permission to all producers in the area to increase prices by 10 per cent. At least one producer published a list of prices on the new basis. Mr. Ahearn mentioned also smaller increases, expressed in dollars rather than in percentages, granted in Memphis, Miami, and a few other areas. In all some eight or ten sand-and-gravel producers have been given price relief by the O. P. A.

Mr. Ahearn discussed briefly the industry's situation with regard to equipment and repair parts, saying that it was getting along well with its present priority status. However, even though the position of the industry is satisfactory from the preference-rating standpoint, truck repair parts are not obtainable and the truck-tire situation grows steadily worse. One producer told of being lent truck tires by the Navy for use on trucks delivering material on specific jobs.

Interesting and helpful information bearing on the industry's obligations under federal statutes covering wages, hours of work, etc., was contributed by Mr. Ahearn. He said that certain building-trades unions had shown a desire to impose on the sand-and-gravel industry the same wages as are in effect in the construction industry by attempting to place the aggregate industry in the construction-industry classification. With a single exception the sand-and-gravel industry is not paying construction-industry wages.

Mr. Ahearn reminded his listeners that the industry is covered by Executive Order 9240, which, for example, forbids the payment of overtime on Sundays even where that is provided for in union contracts, in spite of what may be alleged to the contrary by those who are seeking to bring the sand-and-gravel industry within the construction-industry classification. The construction industry is exempt from compliance with the provisions of Executive Order 9240.

On the obligations of producers under the Fair Labor Standards Act (the wage-and-hour law) Mr. Ahearn said that unless the materials produced move in interstate commerce the employees who produce them are not subject to the law. Materials used in highway repairs are not involved in interstate commerce, even though the highway repaired may be an interstate road. Railroad ballast presents some difficulties because of uncertainty of the place of its use. In short, the material produced must move out of the state in which it has been produced to be brought under the law.

The board gave some time to the consideration of a bonus-retirement plan for the association's staff and further study was recommended.

The following members of the association and guests were present:

V. P. Ahearn, National Sand & Gravel Assn., Washington, D. C.
Theo. Aulmann, Eagle Iron Works, Des Moines, Ia.
Fred F. Bartel, St. Joe, Mo.
J. Fennell Berger, John A. Roebling's Sons Co., Trenton, N. J.
Q. W. Best, Consolidated Rock Products Co., Los Angeles.
W. A. Bliss, Dravo Corp., Pittsburgh.
E. W. Boynton, Northern Gravel Co., Muscatine, Ia.
H. P. Caldwell, Ohio River Sand Co., Louisville.
Claude L. Clark, Ohio Sand & Gravel Assn., Columbus, O.
Otto S. Conrades, St. Louis Material & Supply Co., St. Louis.
R. N. Coolidge, Cumberland River Sand Co., Nashville.
H. S. Davison, J. K. Davison & Bro., Pittsburgh.
Joseph Dixey, Transit-Mix Concrete Corp., New York.
R. C. Fletcher, Flint Crushed Gravel Co., Des Moines.
Alexander Foster, Jr., Warner Co., Philadelphia.
D. D. Guilfoil, Sauerman Brothers, Inc., Chicago.
S. W. Hadden, President American Assn. of State Highway Officials, Indianapolis.
Hal H. Hale, American Assn. of State Highway Officials, Washington, D. C.
Mrs. M. M. Himmler, National Sand & Gravel Assn., Washington, D. C.
Walter F. Jahncke, Flint Sand & Gravel Co., New Orleans.
V. O. Johnston, Lincoln Sand & Gravel Co., Lincoln, Ill.
C. L. Luker, McGrath Sand & Gravel Co., Lincoln, Ill.
Daniel J. Miller, Portland Sand & Gravel Co., Portland, Pa.
Robert Mitchell, Consolidated Rock Products Co., Los Angeles.
M. A. Neville, Western Indiana Gravel Co., Lafayette, Ind.
Bror Nordberg, *Rock Products*, Chicago.
E. J. Nunan, Buffalo Slag Co., Buffalo.
H. F. G. Pelsue, Metropolitan Sand & Gravel Corp., Port Washington, N. Y.
H. C. Peters, T. L. Smith Co., Milwaukee.
Stanley A. Phillips, PIT AND QUARRY, Chicago.
T. E. Popplewell, Fort Worth Sand & Gravel Co., Fort Worth, Tex.
Robert J. Potts, Potts-Moore Gravel Co., Waco, Tex.
J. P. Eyre Price, Wyoming Sand & Stone Co., Scranton, Pa.
John Prince, Stewart Sand & Material Co., Kansas City, Mo.
F. W. Renwick, Chicago Gravel Co., Chicago.
George W. Renwick, Chicago Gravel Co., Chicago.
Nathan C. Rockwood, *Rock Products*, Chicago.
Walter W. Ropers, McGrath Sand & Gravel Co., Lincoln, Ill.
John Sankey, Chicago Gravel Co., Chicago.
Joseph Scheinen, James A. Norton, Inc., New York.
A. R. Shiely, J. L. Shiely Co., St. Paul.
C. W. Shirey, Waterloo, Ia.
Frank P. Spratlen, Jr., Spratlen-MacDougall, Inc., Denver.
Stephen Stepanian, Arrow Sand & Gravel Co., Columbus, O.
E. Guy Sutton, Mattoon, Ill.
W. E. Trauffer, PIT AND QUARRY, Chicago.
Stanton Walker, National Sand & Gravel Assn., Washington, D. C.
R. E. Weaver, Lincoln Sand & Gravel Co., Lincoln, Ill.

Ready-Mixed Operators Report on Present Business Outlook

FOLLOWING a meeting of the technical committee on August 14, the board of directors of the National Ready Mixed Concrete Association met the next day in Chicago. Truck-mixer standards, business conditions, labor relations, and government regulations affecting the industry were among the subjects discussed.

Stephen Stepanian, president of the association, reviewed briefly the work of the organization and commented on the growth in membership, 75 new active members having been added since January of 1943. The membership list now includes 182 active members (producers of ready-mixed concrete) and 30 associate members (manufacturers of equipment and publishers). Robert Mitchell (Consolidated Rock Products Company, Los Angeles) was cited for having brought in many new members from southern California.

The board expressed approval of the type of convention program adopted for 1944, and this pattern will be followed in making plans for the 1945 convention next January. Executive Secretary Vincent P. Ahearn reported that the machinery manufacturers had expressed satisfaction with the arrangements that had been made for them as a partial substitute for the lack of exhibits.

H. F. Thomson (General Material Company, St. Louis), chairman of the association's technical committee, discussed the manual, *Control of Quality of Ready-Mixed*

Concrete, which has just been released by the association. The objectives which those who prepared the manual sought to attain are expressed in the first paragraph of the foreword, which says in part:

"Control of quality of ready-mixed concerete has been a principal topic of discussion at each annual convention of the association for a number of years. Many valuable suggestions have been offered in the course of these discussions but they have not been made conveniently available to the many interested in applying them. Early in 1942 the problem of assisting the industry as a whole to accomplish improvement in the production of concrete was discussed realistically by the board of directors and the technical committees of the association. The consensus of this discussion was that it is the responsibility of the industry itself, rather than the consumers of its products, to lead the way in determining what controls are necessary to insure that the well-intentioned producer can furnish ready-mixed concrete of uniformly high quality."

Mr. Thomson referred to the manual as a framework for a revised edition which will appear later and embody the results of criticisms and suggestions offered by users as well as producers of ready-mixed concrete.

The Truck Mixer Manufacturers' Bureau, the organization and purposes of which were described in these pages some months ago (*P & Q*, February, 1944, page 103), submitted to the association's technical committee and to the board of directors specifications for "standard" sizes of truck-mixers, their capacities when used as agitators, their drum volumes, etc. These proposals will be discussed and the accepted standards will be released soon.

Director of Engineering Stanton Walker brought to the board's attention some facts and views bearing on the use of air-entrained cement. He pointed out that the lack of ability to control the amount of air entrained in the cement has resulted in reductions in the strength of the concrete made from it. He said that the requirements of the American Society for Testing Materials covering the use of Vinsol resin provided too much air-entrainment in allowing from 0.25 to 0.45 per cent. The new requirements eliminate the lower requirement.

It is doubtful whether any concrete will be made without the use of air-entrained cement, once the problems of adequate control of its manufacture have been worked out. Several of those present expressed their doubts whether the increased use of air-entrained cements would result in the abandoment of agitators in favor of open-top dump trucks. One producer said that tests he had made with open-top dump trucks showed excessive segregation of the concrete in transit.

Despite labor-union contract provisions to the contrary, the industry is covered by the requirements of Executive Order 9240, according to Mr. Ahearn. He mentioned the attempts of certain labor unions to classify the ready-mixed-concrete industry as a construction-industry group and so make it exempt from the provisions of that order and subject (though not legally) to the wage scales prevalent in the construction field.

Mr. Ahearn referred to recent price rulings by the Office of Price Administration with respect to cement and ready-mixed concrete as reported in these pages recently. It appears doubtful that the O. P. A. will follow in other parts of the United States the policy adopted with respect to cement prices in the northeastern area.

The speaker read the report of the committee which had been assigned the task of studying contract forms, the problem of truck waiting time at points of delivery and covering it in contract provisions, and related subjects.

Mr. Ahearn reminded his audience that the AA-2 rating still applies to the ready-mixed-concrete industry. There is still a serious shortage of truck repair parts and truck tires.

He then asked producers present to report briefly on the present state of business in their territories. Summarized, their comments reveal the following situations by cities:

Indianapolis. — 1944 business 10 per cent. of normal and about the same as 1943. Thirty per cent. of this producer's business comes from his portable plants.

Boston.—1944 business is about one-third that of 1943. There was a 50-per cent. drop in the last quarter of 1943. Recent business is principally small orders for repair jobs, roads, etc.

Cincinnati.—1944 business is 50 per cent. below that of 1943.

St. Louis.—1944 business is one-half of that of 1943. Big construction is ended. Small industrial jobs are increasing in number.

Buffalo.—Business in the first part of 1944 was slow—50 per cent. off. During the last three weeks airport-runway projects have developed. The year 1944 may run 70 per cent. of 1943.

Denver.—1944 was slow in starting. There is much railroad work and much maintenance. 1944 will about equal 1943.

St. Paul.—In the city business in 1944 is about equal to that of 1943; outside the city it is not more than half of that of 1943.

Philadelphia.—1944 business is off 50 to 60 per cent. from 1943 levels. Miscellaneous work has become important.

Kansas City.—1944 business is no more than half of that of 1943. Small business prevails.

Louisville.—1944 business is one-half or less than half of that of 1943. Orders are for small quantities.

Waterloo.—1944 business is larger than that of 1943. Small industrial orders prevail.

New York.—1944 business is only half of that of 1943, which was a poor year.

Washington.—Business in 1944 is off 40 per cent. from 1943. Business is almost entirely small C. O. D. orders for from 1 to 2 cubic yards.

Columbus.—1944 business is 45 per cent. below that of 1943.

Stanley A. Phillips (PIT AND QUARRY) presented a brief report on a preliminary investigation he had made at the association's request of suitable plans for conducting a safety competition among ready-mixed-concrete producers. The board authorized the president to appoint a committee to give the subject further study with a view to the adoption of a plan to be inaugurated after the war.

Those in attendance included the following association members and guests:

V. P. Ahearn, National Ready Mixed Concrete Assn., Washington, D. C.

Q. W. Best, Consolidated Rock Products Co., Los Angeles.

Claude L. Clark, Ohio Ready Mixed Cocrete Assn., Columbus, O.

B. F. Devine, Chain Belt Co., Milwaukee.

Joseph Dixey, Transit-Mix Concrete Corporation, New York.

Clarence E. Ehle, The Cleveland Builders' Supply Co., Cleveland.

R. C. Fletcher, Flint Crushed Gravel Company, Des Moines.

Alexander Foster, Jr., Warner Company, Philadelphia.

William Goldie, The Goff-Kirby Company, Cleveland.

C. Gray, Ready Mixed Concrete Corporation, Indianapolis, Ind.

Louis G. Hilkemeier, Chain Belt Company, Milwaukee, Wis.

Mrs. M. M. Himmler, National Ready Mixed Concrete Assn., Washington, D. C.

(*Continued on page* 96)

Portable Plant Built by Owner Turns Out 70 Tons of Fine Stone per Hour

General view of plant, conveyors, stock piles and shovel in quarry.

another ON THE SPOT report

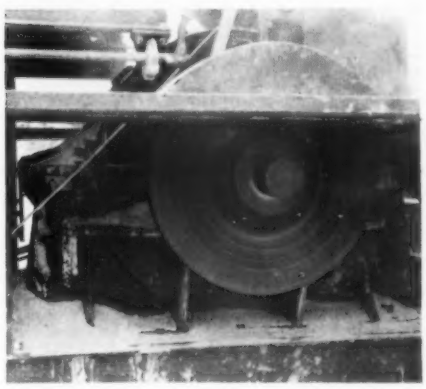
A completely portable crushing plant that is small and compact, yet able to produce up to 70 tons per hour of agricultural limestone and road-maintenance material is attracting considerable attention in northern Illinois this season.

The plant, built and operated by Frank M. Butler of Franklin Grove, Illinois, is working a deposit just east of Lee Center, near Dixon. There is no quarry-to-plant transportation problem, the entire set-up being moved frequently to enable the shovel to load directly into the plant hopper. This shifting of the plant usually requires no more than 20 minutes. Only four men are needed to handle the entire output —Mr. Butler at the plant, a shovel operator, a bucket-loader tender, and a general maintenance and utility man.

Feeder and vibrating screen.

Of all-steel construction the plant proper was built in Mr. Butler's well-equipped shop in Franklin Grove last winter. It is 54 feet long, mounted on 8 pneumatic tires, and weighs 18 tons. The ½-cubic yard Insley shovel, gasoline-powered and crawler-mounted, loads the broken-down stone directly into a 30-inch by 6-foot apron-feeder equipped with sloping sides to form a hopper. The stone is fed to a 3- by 8-foot single-deck Cedar Rapids screen equipped with 1-inch wire cloth, the oversize passing to a Gruendler 3XB hammer-mill, the screen "throughs" and hammer-mill product traveling *via* a short belt to an inclined conveyor. The discharge from this conveyor is to a gravity screen equipped with ½-inch wire cloth. The screen is set at a sharp angle, however, so that little material over ⅛ inch in size passes the openings. The "throughs" are sold as agricultural stone and are carried to stock piles by a 45-foot portable conveyor. Another 45-foot conveyor carries the oversize to the road-stone stock piles. A Barber-Greene bucket-loader loads the trucks. Several owner-operated dump trucks equipped with Flink self-feeding tailgate spreaders are busily engaged in hauling the flagstone. This material sells for $1.10 per ton (O.P.A. ceiling) at the plant and the truckers charge 7 cents per ton-mile for hauling and 40 cents per ton for spreading.

By HARRY F. UTLEY



This hammer-mill does all the crushing.

Another quarry view. Tractor shovel in foreground.

Loading one of the limestone-spreader trucks.

A Caterpillar D8800 Diesel engine mounted on the crushing plant drives the feeder, hammer-mill, vibrating screen and plant conveyors through V-belts and flat transmission belting. Each of the 45-foot portable conveyors is driven by an International 5-horsepower gasoline engine. A Chicago Pneumatic 105-c.f.m. portable compressor supplies air to the jackhammers used for drilling. Mr. Butler is now building a well drill of his own design which will do the major share of the drilling in the near future. A tractor shovel mounted on a small Allis-

Inclined stationary screen which takes out the agricultural stone.

Chalmers tractor is used for cleaning up around the plant and stock piles. This attachment was also built in the Butler shop.

Mr. Butler's son, Donald, is operating a similar plant near Steward, Illinois, this year.

As with other producers, Mr. Butler's biggest troubles at present involve the man-power shortage and the inability to obtain needed equipment. To keep the plant operating at capacity with the ½-cubic yard shovel—he has been unable to acquire a large unit—requires an expert shovel man. Since his younger son, a proficient shovel operator, was drafted several months ago Mr. Butler has been training an inexperienced man and this has, of course, lowered the plant's output. On the other hand, when the bucket-loader operator, who had loaded a maximum of 82 truckloads a day, quit to take a war-plant job, Mr. Butler hired a 17-year-old boy

Portable compressor which supplies drilling air.

just out of school to replace him. An agile youth who likes working with machinery, he loaded 97 dump trucks the first day he was regularly employed after a short breaking-in period! Since then he has handled more than 100 truckloads daily.

"But he'll be 18 this fall," sighed Mr. Butler, "and off to the wars, too. Still, I guess that's the only way we can exterminate Hitler and Hirohito and bring my boy and yours back to their homes and their regular jobs."

R. M. C. *(from page 94)*

Walter F. Jahncke, Jahncke Service, Inc., New Orleans.
Kenneth P. Kerr, Butler Bin Co., Waukesha, Wis.
James F. McCracken, American Builders' Supply Co., Louisville.
R. McLean Jaeger Machine Co., Columbus, O.
Charles P. Maloney, Maloney Concrete Co., Washington, D. C.
Robert Mitchell, Consolidated Rock Products Co., Los Angeles.
William Moore, P. J. O'Connell Co., Boston.
Bror Nordberg, *Rock Products*, Chicago.
E. J. Nunan, Buffalo Slag Co., Buffalo.
H. F. G. Pelsue, Metropolitan Sand & Gravel Corp., Port Washington, N. Y.
H. C. Peters, T. L. Smith Co., Milwaukee.
Stanley A. Phillips, PIT AND QUARRY, Chicago.
T. E. Popplewell, Fort Worth Sand & Gravel Co., Fort Worth, Tex.
Robert F. Porter, Harry T. Campbell Sons Corp., Towson, Md.
John Prince, Stewart Sand & Material Co., Kansas City, Mo.
Nathan C. Rockwood, *Rock Products*, Chicago.
Joseph M. Scheinin, James A. Norton, Inc., New York.
A. R. Shiely, Guaranteed Concrete Co., St. Paul.
C. W. Shirey, Waterloo, Iowa.
Frank P. Spratlen, Jr., Ready Mixed Concrete Co., Denver.
Stephen Stepanian, Arrow Sand & Gravel Co., Columbus.
H. F. Thomson, General Material Co., St. Louis.
Stanton Walker, National Ready Mixed Concrete Assn., Washington, D. C.
Julius J. Warner, Richter Concrete Corp., Cincinnati.
J. C. Witt, Marquette Cement Mfg. Co., Chicago.

Erects New Products Plant in Oregon

The Deschutes Concrete Products Company has been formed at Redmond, Oregon by Chester T. Lackey, well-known concrete-pipe producer at Ontario, Oregon.

The new plant is reported under construction. Keith Parkinson, son-in-law of Mr. Lackey, will superintend the operations.

Increases Sheet-Mica Price to $8 a Pound

A new sheet mica price of $8 per pound went into effect August 7 when the government's subsidizing agency, the Colonial Mica Corporation, began paying that price for full trim sheets to cut 1½ by 2 inches or larger. There is no change in the price for the smaller sizes. The new price compares with $6 per pound being paid for three-quarters trim mica.

International Builds Pilot Plant in West

Plans for the development of phosphate-rock resources in western Montana and the construction of a pilot plant for milling in Granite county have been announced by the International Minerals & Chemicals Corporation.

E. C. Anderson is resident manager at Drummond, and C. Sewell Thomas has been named consulting engineer.

New Quarry Opened in Pike County, Illinois

The East St. Louis Stone Company of East St. Louis, Illinois, has begun construction work at a new quarry site in Pike County, according to W. G. Grammer, traffic manager of the company. The new quarry site is on the Illinois river 23 miles southeast of Pittsfield. The firm hopes to begin production in Pike County some time this month.

Portable De-Sanding Plant, 632-Foot Conveyor Installed by Ohio Operator

THE Ohio Gravel Company at Newtown, Ohio, has developed a unique and effective piece of equipment which at first glance suggests something dreamed up by Professor Rube Goldberg in one of his wilder moments. In haste it should be added that the resemblance is purely superficial, for the "de-sander," as it is called, has none of the circuitous, 'round-Robin-Hood's barn characteristics of Mr. Goldberg's creations. On the contrary it performs a necessary task in what appears to be the most direct and efficient manner possible. Although the name de-sander correctly describes the function of the equipment as it was designed, it should be noted that there is no waste product involved in the operation. The minus-1-inch material has found a ready market.

Part of the de-sanding plant showing the 2-deck screen.

A general view of the de-sander in operation. Two-compartment loading bin in foreground.

The need for de-sanding equipment came about as a result of the demand for crushed gravel exceeding the amount of oversized material made in the company's crushing-and-screening plant at Newtown. The equipment operates in a bank containing about 6,000,000 cubic yards of material located about half-a-mile east of the main plant.

The de-sander is primarily the creation of Walter J. Flach, vice-president in charge of operations of the Ohio Gravel Company. All the equipment is mounted on a Marion 70 shovel frame, and power is generated with a 62-kv. a. Waukesha gasoline-engine-generator.

The material is recovered from the bank by a Northwest Number 5 shovel with a 1¼-cubic yard bucket. A steel hopper mounted on the de-sander feeds a 36-inch by 32-foot belt-conveyor which discharges on a Kennedy 4- by 10-foot double-deck vibrating screen. Sizes 6 inches to 3 inches and 3 inches to 1 inch, run out on two 24-inch by 45-foot belt-conveyors supported side by side on a trussed boom. These conveyors discharge into a Johnson 2-compartment 30-ton Octo bin, from which trucks take the oversized material to the main plant where it is stock-piled for the crushers.

Size minus-1-inch material runs out on an 18-inch by 80-foot belt-conveyor supported by a trussed boom mounted at right angles to the center-line of the shovel frame. This material is piled at the site and hauled by trucks directly to road jobs.

All the conveyors are driven by Louis Allis motors through Falk speed-reducers, and are equipped with Cincinnati Rubber Company belts. Jeffrey idlers and pulleys are used. Texrope V-belts drive the Kennedy vibrating screen.

The entire plant moves as a unit on crawlers, using the original gearing on the Marion shovel-frame and

Panoramic view of main portion of new conveyor.

Shovel loading hopper on the de-sander.

a 40-horsepower General Electric variable-speed motor and a Jones worm-gear speed-reducer. The original steering or cutting screw is powered by a 10-horsepower motor through a chain drive. The controls and switchboard for all the drives are mounted at the generator. The bins are attached to the de-sander superstructure by cables, and slide on timber runner-shoes when the plant is shifted.

The de-sander plant was first operated in 1941 and now handles about 600 tons of material per day, of which roughly 50 per cent. is of crushing size. It is operated about seven months out of the year.

The Ohio Gravel Company has recently placed in operation at this plant a new 24-inch by 632-foot belt-conveyor for hauling excavated material from the rim of an open pit to the receiving hopper of an existing conveyor that feeds the crushing-and-screening plant. The new installation, which was supplied by the Continental Gin Company, replaces a cable car and hoist arrangement that had been used for a number of years. The latter equipment not only demanded a considerable amount of maintenance at frequent intervals, but it required the constant attention of two men to operate it—two men whose services were badly needed elsewhere in a plant which has felt the full impact of the war-time labor shortage.

Both these defects, maintenance and man-power shortage, were remedied since the conveyor requires only the simplest routine maintenance. Electrical controls are interlocked with the present conveyor, thus eliminating the need of an operator to run it.

The conveyor, which started operating in June of this year was furnished in its entirety by Continental with the exception of the feeder and drive. The drive consists of a 30-horsepower General Electric variable-speed slip-ring motor direct-connected to a Jones worm-gear speed-reducer, which is connected to the headshaft of the conveyor through a chain drive having a 4-to-1 reduction. At its average belt speed of 250 feet per minute the conveyor handles about 175 tons per hour of material. This is approximately the same capacity as that of the replaced cable cars since there was no reason for effecting an increase. The belt furnished by Continental is a Goodyear 4-ply, 42-ounce duck with 1/8- and 1/32-inch covers.

This view of the conveyor was taken looking toward the pit.

Another view of the conveyor looking toward plant.

The frame of the conveyor rests on cross ties which were placed on the incline formerly used for the cable cars. The setting was made without ballast, since in the course of time the normal droppings from the belt will provide any ballast that might be required. Since the con-

(*Continued on page* 104)

Liberty Limestone's Plants Now Have Total Daily Capacity of 2,000 Tons

another ON THE SPOT report

THE Liberty Limestone Corporation of Rocky Point, Virginia, with crushing and grinding plants there and at Buchanan, Virginia, has for many years been a leading producer of agricultural limestone, asphalt and fertilizer filler, stone sand and other types of pulverized products. Because agstone is a major product, the company was able to buy the new equipment necessary to rebuild the Buchanan crushing plant when it was destroyed by fire March 31, 1943. All the equipment except a secondary crusher was damaged beyond repair but the adjacent pulverizing plant was undamaged. Full-scale operation was resumed in November, 1943.

The company was formed in 1918 to operate a crushed-stone plant at Rocky Point. This had a capacity of 1,000 tons in 8 hours which has not been changed although numerous improvements were made from time to time. The grinding department there was added in recent years and has a capacity of 500 tons in 24 hours. In 1942 a new hammer-mill was installed and in 1943 a roller-mill replaced the original grinding unit.

The Buchanan crushing and grinding plants went into operation in October, 1943, and have been enlarged and improved several times. The capacity of these operations is now 1,000 tons of crushed and 1,000 tons of pulverized stone daily. At both locations the grinding department is operated 24 hours daily, but quarrying and crushing are confined to 8 hours daily because of the labor shortage. A roller-mill was installed at Buchanan in 1938 to supplement the original rod-mills, and a second one was added in 1943.

The Buchanan plant with James River and a competitor's plant in the distance.

An interesting feature of these operations is the fact that the deposit at Buchanan is dolomite and that at Rocky Point is high-calcium limestone although they are only 10 miles apart. The Rocky Point deposit averages 98 per cent. $Ca\ CO_3$ and that at Buchanan contains 43 per cent. $Mg\ CO_3$ and 54 per cent. $Ca\ CO_3$.

The crushed products of both plants are sold for use as concrete aggregates, railroad ballast, etc. Some rip rap is also produced. The Rocky Point limestone is also in some demand as blast-furnace flux and for use in carbides, glass and chemical manufacturing. Both grinding plants make stone sand, asphalt and fertilizer fillers, dust for coal mines, and agstone, some agstone users and fertilizer manufacturers preferring the dolomitic products. Feed lime is also made at Rocky Point.

This company has installed a system for the protection of its larger motors and most of its important equipment which could well be emulated by other producers during this period of shortages. In both grinding and crushing plants all the important motors are connected to ammeters which are marked to indicate at a glance if they are overloaded. This condition would mean a shortage of oil, a bad bearing, or some other serious trouble. This system alone is credited by officials of the company with having saved it thousands of dollars in avoiding lost

The Rocky Point operations with electric railway from quarry at extreme right. Pulverizing plant at left.

A view in the Buchanan quarry.

production and repair and replacement costs.

The secondary-crusher bearings at both locations are connected to Bristol indicating thermometers, supplemented by bell and light alarms, to warn against excessive lubricating-oil temperatures and overheating of the bearings. This precaution is especially important when fine crushing is done in hot weather.

The company also has General Electric time clocks connected to each of the 15 mills and crushers in these plants. These are tied in to a motor switch so that the clock starts when the switch is closed and stops when it is opened. The company's records make it possible to predict approximately when certain repairs will be necessary and when parts and accessories will need to be replaced. It has also resulted in giving the company very definite information on the relative merits of various types and makes of equipment, supplies, etc., which it has used.

The Buchanan quarry now has a maximum height of face of 425 feet which will be increased somewhat as operations are carried farther back into the hill. There is little overburden but many trees to remove. As the face is too close to the plant for well-drill shots to be made, it is quarried in 20-foot benches with Gardner-Denver and Ingersoll-Rand jackhammer drills. The better fragmentation obtained in this manner is an advantage with the preponderance of fine products being made. Very little secondary shooting is necessary as most of the rock breaks in falling. Timken detachable bits are used. In addition to their other advantages these bits save the drill operators much climbing. When a man goes up on the high face in the morning he fills his pockets with enough bits to last all day and carries his lunch along. Trojan explosives are used and the air for drilling is supplied by two Sullivan WJ-3, angle-compound 300-c.f.m. compressors.

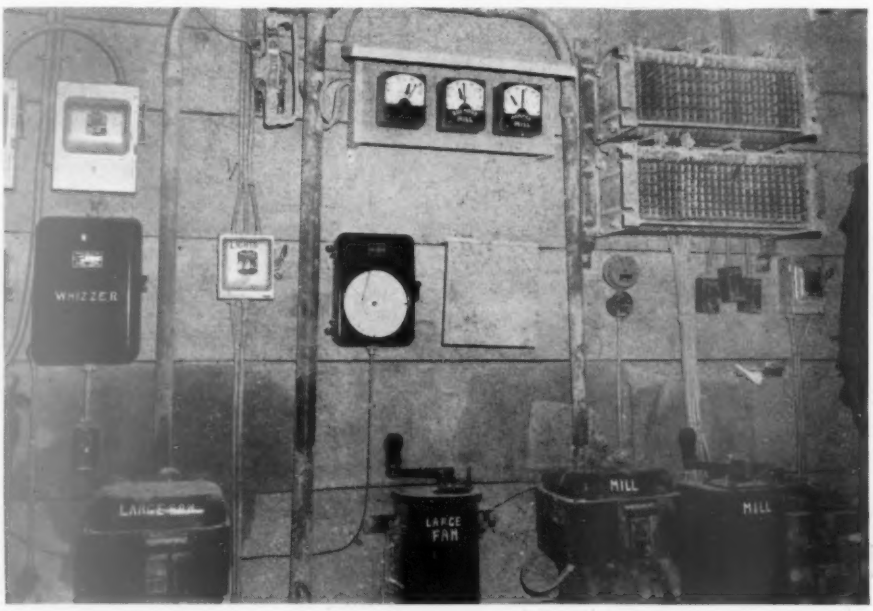
The loading of stone at the face is done by 2 Osgood 1½-cubic yard steam shovels. A Koehring Dumptor and a 1½-ton Chevrolet truck haul the stone an average distance of about 700 feet to the plant. There the stone is discharged on a 36-inch by 12-foot Traylor apron-feeder which provides a steady and uniform feed to the 24- by 36-inch Traylor jaw crusher. On this length of haul the Dumptor is more efficient than the truck.

Conveyor with weight recorder discharging agricultural stone to a waiting truck.

The minus 4-inch stone from the crusher is carried on a 24-inch by 160-foot belt-conveyor to a 5- by 12-foot Tyler Ty-Rock 2-deck screen. This has a ¾-inch bottom deck and the top deck can be changed to make either ¾- to 2-inch railroad ballast or ¾- to 3½-inch road-base rock over the bottom deck. These products are stored in separate compartments of the 10-compartment, 150-ton concrete storage bin. Cars or trucks are loaded from these bins.

The minus-¾-inch material falling through the bottom deck of this screen goes to other bin compartments from which it is fed to the grinding plant.

The plus-2-inch or plus-3½-inch rock passing over the top deck of this screen goes into a 400-ton surge bin. This feeds 2 Telsmith 36-inch Gyrasphere crushers and a Number 25 Kennedy-Van Saun gyratory crusher for further reduction. One of the Gyraspheres and the Kennedy crush-



Mill control board at the Rocky Point plant.

Sly Dust Filter in a Connecticut rock crushing plant for the suppression and positive collection of dust created by crushing, screening and conveying operations. The same filter is shown in the entire view of plant below.

IN THE CRUSHED STONE FIELD, TOO SLY DUST COLLECTORS DOMINATE

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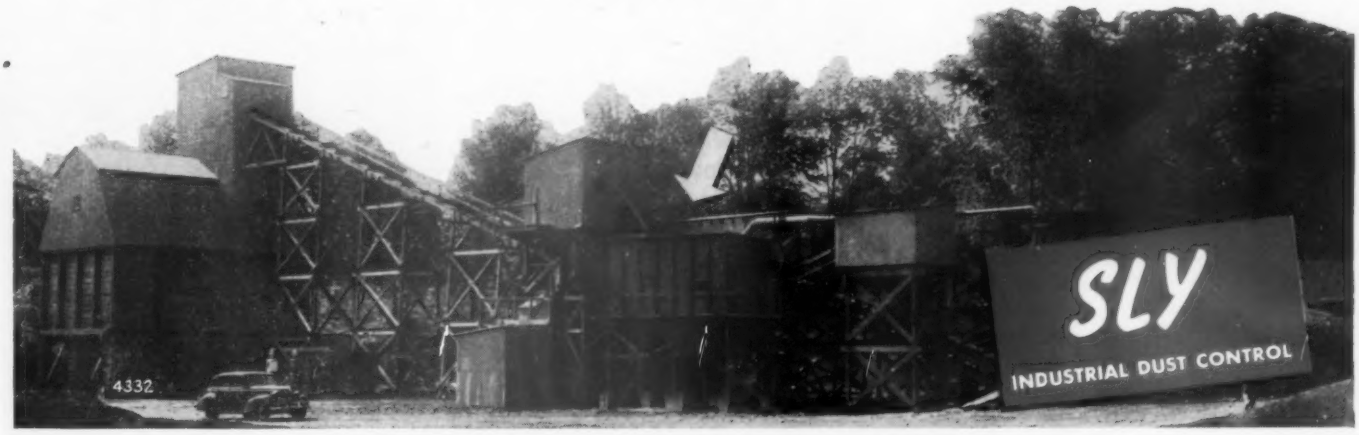
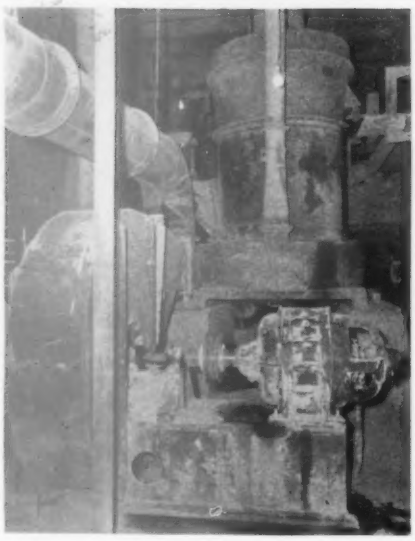




High-side mill at Rocky Point.

er discharge on one, and the second Gyrasphere on the other of two 24-inch belt-conveyors. Each of these feeds one of two 4- by 12-foot Tyler Niagara 3-deck screens. The top decks of these screens make either plus-½- or plus-¾-inch oversize which are returned to their respective crushers by gravity. The middle sizes, usually 3/16-to-½-inch or 3/16-to-¾-inch, go to separate bin compartments to be shipped out as ballast or road-base stone. The stone falling through the bottom decks of these screens also goes to separate bin compartments as feed for the grinding plant.

A horizontal belt-conveyor is used to reclaim from these bins the minus-

Discharging rock from quarry at the Buchanan plant.

3/16, minus-¾-, and sometimes also the minus-2-inch stone for the grinding plant. A series of belt-conveyors carry these materials to feed bins over the grinding mills.

The original grinding department consists of 3 Allis-Chalmers rod-mills—two 6 by 12 feet and one 5 by 12 feet in size. As these mills are not equipped for drying, only plus-⅜-inch material is fed to them in wet weather. At other times they can be fed smaller sizes. The products of these mills are elevated to 3 Tyler Hum-mer 2-deck screens from which the oversize is returned to the mills. This is a flexible system which allows the material from any of or all the mills to be fed to the screens and the oversize to be returned to any or all of them. The other two products of these screens are stone sand and 100 per cent. through 10-mesh agstone, which are discharged into bins. The latter product can go to a 10-foot Sturtevant mechanical separator if a finer product is desired. The separator rejects are combined in the bins with the stone sand. These materials are discharged from their bins through Fuller-Kinyon rotary valves on a 24-inch car- or truck-loading belt-conveyor. A Merrick Weightometer on this conveyor records the amount of material shipped.

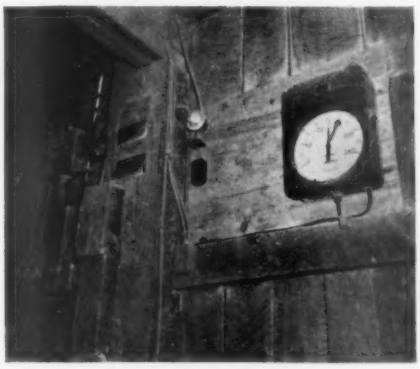
Other feed bins are over the original Raymond 5-roll high-side

Hammer-mill which reduces minus-2-inch stone at the Rocky Point plant.

mill and the new Model 5448 Raymond 4-roll high-side mill. Each of these machines is equipped with a single whizzer separator and has a coal-fired furnace which provides drying air. Each furnace is 12 feet wide by 13 feet long and has a reverse arch to keep the coal from contaminating the product. The firebox is so designed that complete combustion is obtained with the dampers closed and these are only opened when starting up after the shutdown. The temperature of the air going into the mills is about 600 degrees F.

Each mill is also equipped with a cyclone separator, a vent fan to remove vapor, etc. The finished product discharged from the cyclones goes into a 600-ton bin from which it is loaded out in bulk as agstone, asphalt filler, etc. The bin capacity is far too small and will be greatly expanded. These products can also go to a bin over a 1-tube Valve Bag packer.

The chute from each cyclone to the bin has an overflow provision to prevent the material from piling up in the cyclone when the bin is full and causing damage to the equipment or delays for cleaning it out. A door in the chute, hinged

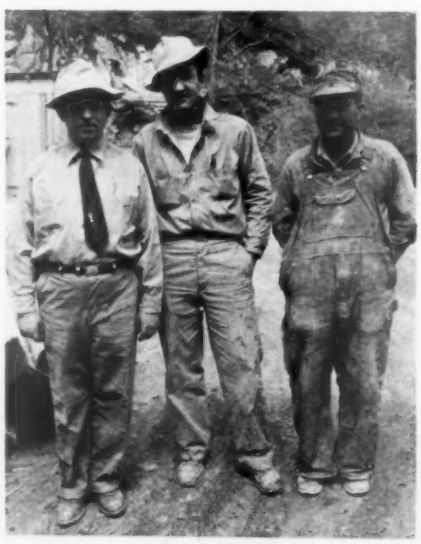


Oil-temperature indicator and other control instruments in the Buchanan plant.

at the top, opens when the material level reaches it, allowing the material to overflow where the operator can see it and shut off the mill.

The Rocky Point quarry is about 1 mile from the plant and has a 250-foot maximum face. At present another level is being opened with wagon drills on the quarry floor. A Number 82 Thew Lorain Diesel shovel with a 2-cubic yard dipper and a ¾-cubic yard Browning shovel load the stone into quarry

(*Continued on page* 104)



These Rocky Point operating heads are, left to right: J. C. Lawrence, general manager; R. C. Smith, superintendent; and W. C. Watts, mill foreman.

REPUBLIC RUBBER PRODUCTS TO DO SPECIFIC JOBS

REPUBLIC engineers study service requirements and design mechanical rubber products to do the job. A typical example is in the phosphate industry, where conditions require specific designing for hydraulic mining and refining of pebble phosphate rock.

Republic Suction Hose, to be attached to dredges or to the line from pit to washing plant, is flexible, yet mechanically strong to withstand collapse under vacuum and will not kink from external abuse. Its tube resists the cutting action of solid material in suspension.

Republic Phosphate Flexibles, used to cushion vibration at the pump, are wear-resisting and reinforced internally with heavy wire windings to withstand high pressures and surges.

For washing and recovery operations Republic Conveyor and Elevator Belts are specially designed to handle wet material. Where reagents are present, which are destructive to natural rubber, oil resisting types of belting are furnished. For high temperatures in drying and storage, destructive to standard belts, Republic has developed special Heat Resisting Conveyor and Elevator Belting to handle the hot phosphate.

Processing and refining operations in the Phosphate Industry depend on Republic Flat Transmission Belting, V-Belts, Water Hose for jetting and flushing, Air Hose, Oil Hose, Chute and Launder Lining, Packings and numerous rubber items. All these classes of service have been carefully studied by Republic engineers and for each application a product has been designed for the job.

WE ARE PARTICIPANTS IN THE OWNERSHIP AND OPERATION OF NATIONAL SYNTHETIC RUBBER CORPORATION

REPUBLIC RUBBER

YOUNGSTOWN 1 • • OHIO

HOSE • BELTING • MOLDED GOODS PACKING • EXTRUDED PRODUCTS

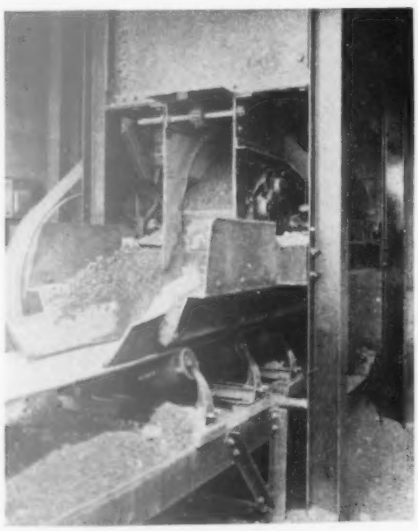
DIVISION OF

LEE RUBBER & TIRE CORPORATION

Ohio Gravel (from page 98)

veyor rises 36 feet from end to end, the head shaft is equipped with a ratchet-and-pawl holdback to prevent reversing when it is stopped under load. A heavily-counterweighted take-up for belt slack is provided about midway between the head and tail shafts.

A head house has been built to provide weather protection for the drive, and when priority restrictions are relaxed the company plans to



Feeder which puts the material on the belt.

cover the entire conveyor with a hood of Armco corrugated sheets.

After the war the company contemplates installing a similar conveyor in its gravel pit to reduce the long cable-car haul now necessary. Under the present method of operating the material is hauled in cable cars some 700 feet across the floor of the pit to a hopper on the side nearest the crushing - and - screening plant. Here it passes through a grizzly and is fed to the new conveyor by an ordinary apron-feeder.

The counterweight which takes up belt slack.

Liberty (from page 102)

cars. Two Whitcomb gasoline locomotives haul the cars out of the quarry to a point where they are taken over by a General Electric electric trolley locomotive which hauls them to the plant over a 42-inch-gauge track.

At the plant the stone is discharged on a 48-inch by 12-foot apron-feeder ahead of the 42- by 48-inch Traylor primary jaw crusher. Further reduction of the stone is accomplished by a 4-foot Traylor Type TZ crusher, a No. 37 Kennedy-Van Saun gyratory, and a 40-inch Telsmith Gyrasphere. The screening is done by 2 Tyler Type 600 3-deck screens.

A 24-inch by 85-foot -conveyor carries stone from this plant to three 140-ton feed bins in the grinding building. Minus-2-inch stone goes into 2 bins over the Williams 40 GA hammer - mill, and minus - ¾ - inch stone into the bin over the Raymond 4-roll high-side mill. The material in one of the hammer-mill bins can also be fed to the Raymond mill if desired. This mill is identical with the one in the Buchanan plant and has the same type of furnace, etc.

The hammer-mill product is elevated to a 4- by 10-foot Tyler Hummer single-deck screen. The plus-10-mesh oversize is usually discharged into the Raymond mill but can be returned to the hammer-mill if desired. The minus-10-mesh material falling through this screen usually goes direct into a bin but can be passed through a 10-foot Raymond Whizzer separator under the screen for further sizing.

The Raymond mill circuit can make a wide range of sizes from 100 per cent. through 10-mesh to 80 per cent. through 200-mesh. The equipment in this plant is so arranged that the two sizes just mentioned and stone sand can be made simultaneously.

This plant has a special charging system which is used at night when the crushed-stone plant is not in operation. The stone is discharged from trucks into a hopper from which an 18-inch by 117-foot belt-conveyor carries it to the top of the plant.

In both plants Link-Belt conveyors, driven through Link-Belt motor-reducers and chains, are used. Goodyear Style W conveyor belting predominates and Gates V-belts are used to drive most of the equipment. Stephens-Adamson Sinden box-car loaders are used.

The officers of the Liberty Limestone Corporation are: O. M. Stull, president, J. L. Teaford, vice-president and treasurer, W. K. Ford, assistant treasurer; J. H. Drewry, secretary. J. C. Lawrence is general manager. R. C. Smith is superintendent at Rocky Point and W. C. Watts at Buchanan.

Agricultural-Stone Capacity Climbing

It is interesting to note the activity that crushed-stone producers are manifesting to meet the increased demand of the Agricultural Adjustment Administration, E. W. Bauman, field engineer of the National Crushed Stone Association, reports. This agency has tentatively established requirements for the 1944 Agricultural Conservation Program of approximately 15,000,000 tons of agricultural limestone, representing an increase over last year's production of almost 50 per cent. While many small producers have set up plants to help supply this demand, usually of 200 to 300 tons daily capacity, the bulk of the tonnage is being furnished by plants of established producers who have in many instances expanded their facilities to materially increase production of this product.

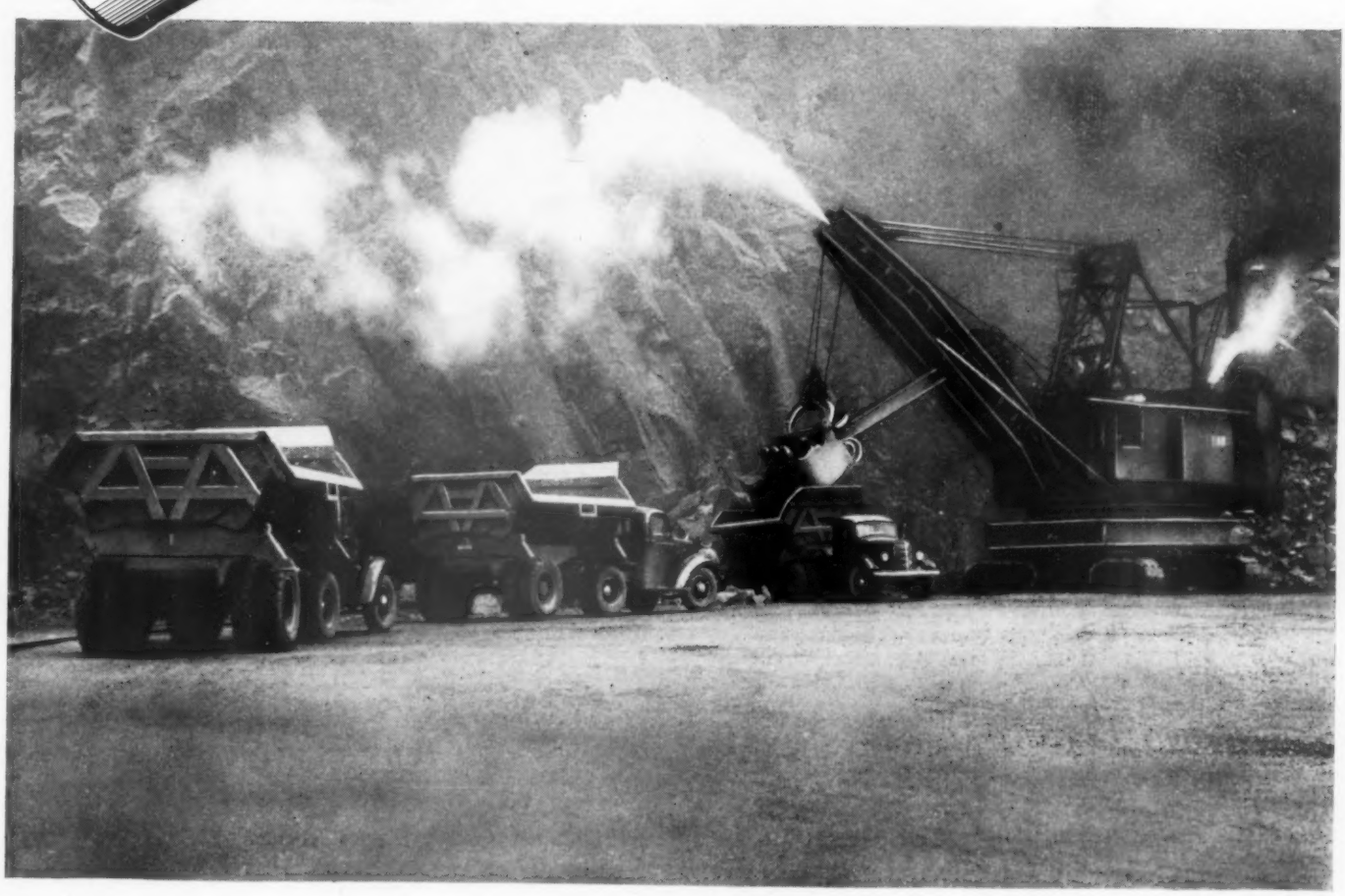
One company in the middle west recently completed the installation of equipment for producing agricultural limestone so that they now have a daily capacity of over 4,000 tons. Another has set up a new plant in one of the southern states which will increase the tonnage produced in that state by many times the total present output.

Permanente Produces New Building Line

Officials of the Permanente Cement Company have disclosed that the company's new asbestos-cement product known as Plastite is now being manufactured and shipped at the rate of 500 tons per month. Plastite is used in plaster or stucco wall construction, and it is said to be adaptable to direct application to gypsum board or paper, eliminating the need for lath or wire. Federal agencies are specifying large quantities of the material for war housing projects.

Bauxite, said to contain relatively few impurities, will soon be mined in Haiti. It will be produced by a private company which has received a 60-year concession from the government of Haiti.

Better LUBRICATION MEANS *Better Maintenance*



• Excessive wear and difficult maintenance often result from inadequate lubrication.

Sinclair provides highly specialized Motor Oils, Gear Oils and Greases for *better lubrication* and better maintenance of *QUARRYING EQUIPMENT*. Sinclair Ten-ol 200 has been specially developed for proper lubrication of Diesel engines and Diesel-powered buckets, shovels, and bulldozers.

• • •

(Write for "The Service Factor" – published periodically and devoted to the solution of lubricating problems.)

SINCLAIR LUBRICANTS-FUELS

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE SINCLAIR REFINING COMPANY, 630 FIFTH AVENUE, NEW YORK 20, N. Y.

Cement made in two of California's largest cement plants is being ground with heat-treated rolled-steel balls manufactured in this plant owned by the American Forge Company at Berkeley, California. This factory is said to be the largest in the West devoted exclusively to forgings. It is busy day and night working on orders for western industrial concerns—shipbuilding, airplane manufacture, lumber, oil and other industries. Forgings up to 150,000 pounds in weight are produced and heat-treated in this plant.

● Diesel Men Meet

The dominating position held by the Chicago area in Diesel-engine manufacturing was revealed July 7 when representatives of the industry met at a luncheon held at Chicago's Union League Club.

The output of the area is the best balanced of any in the country, it was shown, consisting of engines ranging from 5 to 8,500 horsepower, from the slowest to the highest speeds, and engineered for a wide variety of purposes. Post-war markets for Diesel engines, as outlined by the manufacturers, lie in earth-moving machinery, in power and light plants, in locomotives (both industrial and main-line), in bus service, in marine applications and in light and heavy-duty trucks.

Factory reconversion after the war will be a simple matter, it was brought out, since the Diesel was changed but little, if at all, for Army and Navy purposes.

Harvey T. Hill, executive director of the Diesel Engine Manufacturer's Association, stated that in the United States generally Diesel engine production in 1943 and 1944, measured in horsepower, will exceed the production for all the years preceding that period.

The meeting was conducted along unique lines, each representative of the manufacturers present being allotted five minutes in which to describe his company and its products. Press representatives were then permitted to ask questions.

The Atlas Imperial Diesel Engine Company was represented by F. H. Kilberry, president. Volney Fowler, public relations director for the Electro-Motive Division of General Motors, acted as its spokesman. Fairbanks, Morse & Company sent O. O. Lewis, assistant general sales manager, and T. M. Robie, assistant manager of Diesel-engine sales to the meeting. Roland W. Bayerlein, sales manager of the heavy-machinery division, and Delbert Kay, advertising manager, were on hand for the Norberg Manufacturing Company of Milwaukee.

Announcement has been made that the 16th National Exposition of Power and Mechanical Engineering will be held in Madison Square Garden, New York, November 27 to December 2, next. This year's event will be keyed to the effective solution of continuing war production problems, particularly those caused by sudden shifts in military needs. It will also provide informational sources for the advancement of post-war planning.

Held biennially, the National Power Show, as it is commonly known, is recognized for its work in developing more effective utilization of the nation's power resources. The last exposition, held in 1942 in the midst of war work, proved exceedingly helpful to a wide range of new visitors, greatly expanding the service to industries in all fields. It is anticipated that this year's exposition will attract an even larger number of engineers, executives and operating personnel concerned with current production problems as well as preparations for civilian pursuits.

From the Ohio river to tidewater Virginia—such is the territory to be served by the expanded and newly named Rish Equipment Company, distributor of contractors' and industrial supplies. Previously located under other corporate names in Charleston and Clarksburg, West Virginia, and in Roanoke, Virginia, the company recently announced a location in Richmond, will shortly complete details for the opening of the Rish Equipment Company of Cincinnati.

In West Virginia the Charleston Tractor & Equipment Corporation, became the Rish Equipment Company of Charleston; in Clarksburg, the Rish Equipment Company of Clarksburg. The Roanoke Tractor & Equipment Corporation, became the Rish Equipment Company of Roanoke, and the new company, the Rish Equipment Company of Richmond.

The H. K. Porter Company, Inc., of Pittsburgh, has announced the purchase of the Fort Pitt Steel Casting Company, of McKeesport, Pennsylvania, manufacturers of pressure and alloy steel castings. The acquisition brings to six the number of complete industrial plants operated by Porter in the manufacture of process equipment, locomotives, freight cars, pumps, and ordnance material.

Announcement has been made of the incorporation at Cleveland of the Truckstell Manufacturing Company, a stockholder-distributor organization consisting of approximately 40 national distributors of truck equipment, Don Meyer and Milt W. Anderson, founders of the company and other nationally-known transportation experts.

At the incorporation meeting plans were laid for the development and manufacture of new equipment and for expansion of facilities to handle additional lines of manufacturers needing the service of such a national distributor organization. Present lines now distributed include: Eaton 2-speed axles; Thornton 4-rear-wheel tandem drives; Thornton automatic-locking differentials; Truxmore third axles; Clark heavy-duty axles; Clark booster engine conversions; Clark heavy duty cast wheels; Watson auxiliary transmissions and Champion safety gas tanks.

Seven new distributors have been named by the Osgood Company and the General Excavator Company, associate excavating and materials handling equipment manufacturers of Marion, Ohio, according to a joint announcement by Sales Manager George S. Day, of Osgood, and Don B. Smith, of General. They are:

Acme Equipment Company, Detroit; Arthur C. Leake, Middletown, Virginia; Municipal Sales Company, Richmond, Virginia; Walling Tractor & Equipment Corporation, Portland, Oregon; H. L. Baxter, Toronto, Ontario; Rousseau Equipment Company, Winnipeg, Manitoba; and Dominion Distributors, Ltd., St. John's, Newfoundland.

The Ralph B. Carter Company, Hackensack, New Jersey, will manufacture and sell the Markley-Carter dust collector, according to a recent announcement by James H. Markley.

The Markley-Carter dust collector is designed for use in rock-drill dust control, in general excavation in mines, tunnels and quarries, and in power and industrial plants.

Eugene Caldwell, vice-president of the Hyster Company, Portland, Oregon, has announced three important personnel changes. W. B. Morrow, formerly personnel manager, will head up a new department of a confidential nature. Cliff Dunham, who has been in charge of the Hyster Chicago office, becomes personnel manager. Donald Foster of the Portland purchasing department will be transferred to Chicago as office manager.

The Clark Tructractor Division of Clark Equipment Company, Battle Creek, Michigan, manufacturers of fork trucks and industrial tractors, has just received the Army-Navy production award for the third time.

The name of the American-Terry Derrick Company, South Kearny, New Jersey, has been changed to American Hoist & Derrick Company, Plant Number 2.

B. F. Lease, formerly sales manager, has been elected vice-president in charge of sales, advertising and service for the Athey Truss Wheel Company, Chicago. Mr. Lease has been with the company since 1931.

Whiting Corporation, Harvey, Illinois, has announced the appointment of the Cardinal Supply & Manufacturing Company, Omaha, Nebraska, as its exclusive sales representative in the Omaha territory. The Cardinal Company will handle Whiting cranes, railroad equipment, foundry equipment, aviation equipment and the Quickwork line of metal-working machinery.

PERSONAL MENTION

SAMUEL M. SHALLCROSS, director of development and engineering for the Warner Company, Philadelphia, has resigned to engage in industrial-engineering consultation work in Philadelphia. He had been with the company and its subsidiaries for 22 years. IRVING WARNER, vice-president, has assumed direct supervision of the company's development and research work.

Lt. Col. Laird

Lieutenant Colonel C. B. Laird, for years sales manager of the Eagle Iron Works, Des Moines, Iowa, has resumed his duties with the company after three and a half years with the mechanized cavalry, according to an announcement by Theodore Aulmann, president.

Colonel Laird's advice and counsel will be available in solving materials, classifying and washing problems and in planning for post-war improvements.

Colonel Laird served with the air corps in World War I.

W. ALLEN GRUBB, district engineer for the Portland Cement Association, has resigned his post to become associated in a civil and hydraulic engineering capacity with the American Pipe & Construction Company in Los Angeles.

Mr. Grubb had been with the P. C. A. for the past 18 years, and is well-known in the construction industry of the Pacific Northwest.

L. C. ALLENBRAND has been appointed manager of the merchandise department of Caterpillar Tractor Company, Peoria, Illinois, according to an announcement by William Blackie, vice president. Mr. Allenbrand succeeds H. R. Murphy, who has left the company to become associated with the Caterpillar distributorship in San Antonio, Texas.

HERMAN J. HOFMAN has been named director of service and sales research for the J. E. Baker Company, York, Pennsylvania. He had formerly been associated with Lukens Steel Company as open hearth superintendent and advisor for many years.

HERE'S WHAT YOU NEED . . .

The DIXIE Non-Clog HAMMERMILL

for higher Crushing Efficiency

HERE'S WHY YOU NEED IT . . .

You've got to keep up with rapidly increasing demands for crushed rock—a basic need of industry and the armed forces.

The DIXIE Hammermill with its *exclusive* moving breaker plate guarantees continuous high feed and record production on any kind of material handled.

The DIXIE eliminates costy delays, reduces power and maintenance requirements, and combines maximum capacity with high product uniformity.

HERE'S WHERE YOU CAN GET IT . . .

in 40 sizes, for fine, medium and coarse reduction.

DIXIE MACHINERY MFG. CO.
4202 Goodfellow Blvd., St. Louis, Mo.
Please send free booklet on Dixie Non-Clog Hammermills. We want to crush .....
Name .....
Company .....
Address .....
City .....State.....

Reliable . . . as "Old Faithful"
AMERICAN Crushers

Crushed stone producers who use AMERICAN Hammermills are assured of constant dependability in performance and economy.

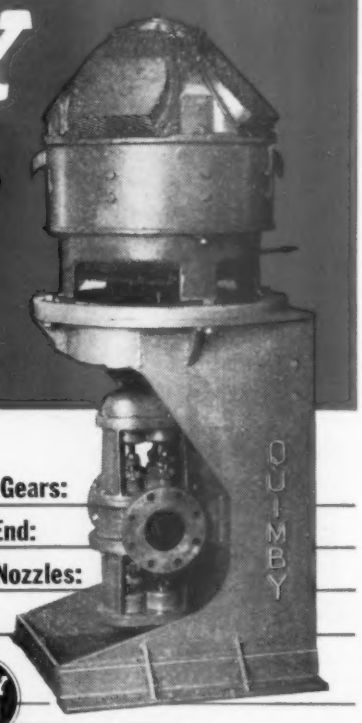
A generation of AMERICAN customers has relied upon the unchanging high standards of AMERICAN Crushers—record output, continuous operation, and unequaled efficiency.

Write for Bulletin

AMERICAN PULVERIZER CO., 1059 Macklind Ave., St. Louis 10, Mo.

QUIMBY
Rotex Pump

THESE 5 NEW FEATURES ASSURE LONGER LIFE, INCREASED EFFICIENCY



1. Double Helical Pumping and Timing Gears:
2. Timing Gears Located at Outboard End:
3. Improved Supporting Feet Ribbed to Nozzles:
4. Heavy Duty Anti-Friction Bearings:
5. Accessible and Interchangeable Parts:

QUIMBY PUMPS

QUIMBY PUMP Division

H. K. PORTER COMPANY, Inc.

General Office: PITTSBURGH 22, PENNSYLVANIA

Factories at Newark, N.J., New Brunswick, N.J., Pittsburgh, Pa., Blairsville, Pa., Mt. Vernon, Ill.

Geo. J. Dimond

GEORGE J. DIMOND has been made sales manager of the Insley Manufacturing Corporation, Indianapolis. He succeeds Ray W. Dorward, who has retired. Mr. Dimond has long been prominent in the construction-equipment industry. Twenty-five years ago he joined the Koehring Company, Milwaukee, as field service representative, rising through a steady succession of promotions to the post of sales manager, which position he held at the time of his resignation on May 31 to join Insley. Prior to his affiliation with the former company, he was engaged in the construction industry.

HOWARD R. MURPHY, formerly manager of the merchandise department of the Caterpillar Tractor Company, Peoria, Illinois, has resigned to become associated as a principal with W. K. Holt in the "Caterpillar" distributorship in San Antonio and Corpus Christi, Texas.

Mr. Murphy joined the "Caterpillar" organization in 1927 as supervisor of agricultural sales in the midwest, and two years later moved to the Pacific coast to supervise farm sales there.

FRANK P. D'AQUILA, well-known lecturer-author on Latin American relations, has been recently named export sales manager of the Iowa Manufacturing Company, Cedar Rapids, Iowa.

NICOLAS FISHER has been made sales and construction engineer for the Western Sand & Gravel Company, Spring Valley, Illinois. He was formerly city engineer at Kewanee, Illinois.

DR. WALTER M. MITCHELL has been appointed director of research for Mack Trucks, Inc., according to an announcement by L. C. Josephs, vice president of the company. Dr. Mitchell will direct chemical, metallurgical, electrical, mechanical, Diesel, fuels, lubricants and other research activities allied to the truck firm's products.

Before joining the Mack organization, Dr. Mitchell was chief metallurgist for the York Safe & Lock Company's special ordnance plant

producing Bofors anti-aircraft guns for the U. S. Navy. He is a graduate of the University of Pennsylvania and received his doctorate from Princeton University.

OBITUARY

BEN ALEXANDER, 49, Wausau, Wisconsin, industrialist and president of the Masonite Corporation, Chicago, passed away recently at Rochester, Minnesota.

CHARLES G. WOODY, SR., 53, superintendent of the Kentucky Concrete Pipe Company, died recently at his home in Louisville, Kentucky. Mr. Woody had been superintendent of the pipe plant since 1928.

M. G. MOORE, 56, owner and operator of the Cooke Stone Company, Hopkinsville, Kentucky, was found shot to death in his office at the stone quarry. Investigating officers determined that the fatal wound was self-inflicted.

JAMES J. CALKINS, 58, secretary-treasurer of the Monolith Portland Cement Company and of the Monolith Midwest Company, died recently at his home in Los Angeles.

Mr. Calkins became associated with the Monolith Company in Los Angeles in 1919, and was the first to install the Portland Cement Association's cost-accounting system on the Pacific Coast.

LESLIE STEELE BRADLEY, 65, former district manager for the Kentucky Culvert Manufacturing Company, died recently of a heart ailment at his home in Louisville.

HARRY S. WHERRETT, 68, chairman of the board of directors of the Pittsburgh Plate Glass Company, associated with the organization for more than 53 years, died on August 13 after a brief illness. He had long been active in business, civic, and philanthropic affairs of the city of Pittsburgh and was born in Connersville, Indiana.

WILLIAM HARTLEY LINDSAY, 48, general manager and secretary-treasurer of Canada Crushed Stone, Ltd., died recently following an illness of several months. Mr. Lindsay had been with Canada Crushed Stone for 20 years. He was also president of Queenston Quarries, Ltd., and a director and secretary of National Cut Stone, Ltd.

PUMP PARTS *Replacement Cost*
LESS THAN 1/4¢ PER TON...

...ON THIS
MORRIS
Medium-Duty Dredging Pump
after pumping 150,000 tons of fine coal

The job was at the inlet of a fine-coal-washer in the St. David, Ill., plant of the United Electric Coal Company. Water supply was limited. That meant a high solids ratio for economical operation. Actually the solids ranged from 34% to 35% by volume, with the particle size minus 1/16". The pump delivers 1200 GPM of this mixture, and handles about 4 times the rated solids output for this size of pump.

After a total delivery of 150,000 tons of coal, the major wearing parts of the pump showed only moderate wear. The parts replacement cost was estimated at less than 1/4c per ton.

LONG LIFE DUE TO SPECIAL, WEAR-RESISTANT MORRIS "FLINTMETAL"

Morris "Flintmetal," a special low-chrome alloy with a Brinell hardness around 700, is responsible for the remarkable wearing qualities of this pump. Unmachinable except by grinding, it outlasts gray iron from four to five times, and it is used by Morris in place of today's synthetic rubber linings which are not holding up as well as pre-war gum rubbers.

● Morris Slurry and Dredging Pumps are making remarkable records for efficiency, long wear and low cost in hundreds of applications. Write today for performance tables, specifications, requirements and other data on pumps suited to the particle sizes, densities and volumes of the material you have to handle.

MORRIS MACHINE WORKS
Baldwinsville, N. Y.
Sales Offices in Principal Cities

MORRIS CENTRIFUGAL PUMPS

Legal Decisions

Independent Contractor Law

Modern courts hold that an "independent contractor" is not entitled to recover compensation under state compensation laws for regular work. However, if the injured workman is an ordinary employee he is entitled to receive compensation for ordinary injuries.

The term "independent contractor" shall be considered to mean any person who renders service for a specified recompense for a specified result either as a unit or a whole, under the control of his principal as to results of his work only, and not *as to the means* by which which such result is accomplished.

For example, in Nesmith *v.* Reich Bros., 14 So. (2d) 325, it was shown that Reich Company had a contract with an agency of the United States to haul and deliver limestone rock from a pit. The company employed various truck owners to haul the rock. Under this employment contract each truck owner was to furnish his own truck, buy oil, gas, etc., from the company and pay for it himself. He was paid 70c per cubic yard for rock delivered, and was required to operate his truck continuously for 24 hours each day, except possibly Sunday. The truck driver was not obligated to haul a specific quantity of rock. No term for the contract's duration was fixed. However, he was subject *to the orders* of the company and performed his duties strictly as directed by his agents. He did have the right to select his own helpers, fix their rate of pay and discharge them at will.

One day a truck driver was seriously injured and he sued to recover compensation under the State Workmen's Compensation Laws. It was contended that the driver was an independent contractor and, therefore, not entitled to receive compensation. However, the higher court considered all of the above facts and in holding that the driver was an ordinary employee and entitled to recover state compensation, the court said:

"The undisputed facts of the case negative the idea that plaintiff, in legal contemplation, was independent as regards his contractual relations with and duties to his employer. He was working for a specified recompense but not for a specified result, and was under the control of his principal as to the means and methods by which the work was to be accomplished. He enjoyed no power of discretion as to when the work should be done since he was required to work twenty-four hours of each day."

Jury Awards Verdict

Under ordinary circumstances a seller of nonmetallic materials is within his rights when he sells material rejected by a purchaser and then suing and recovering from the latter the difference between the original contract price and highest price obtainable on the open market. Whether the price at which the seller sold the merchandise is reasonable depends upon the judgment of a jury.

For instance, in Escanaba Company *v.* Herbert, 51 N. E. (2d) 1004, reported January, 1944, the testimony proved that a seller contracted in writing to supply a purchaser with a definite quantity of plywood at 12½ cents per square foot. The purchaser refused to accept delivery of the plywood on the contention that the various panels could not be used for the purpose for which they were purchased. The seller sold the panels on the open market for 7 cents per square foot and sued the purchaser to recover 5½ cents per square foot for the panels. The purchaser defended the suit on the grounds that the market prices were from 12½ cents to 14½ cents, and that the seller sold the plywood as a job lot at 7 cents per square foot, which was unreasonable. However, the higher court held the purchaser liable to the seller for an additional 5½ cents per square foot of the panels and explained that specially manufactured merchandise can not be expected to sell on the open market at the original contract price.

Law of Trade-Marks

Modern higher courts consistently hold that the owner of an established trade-name is entitled to an injunction against another's use of a name so similar that it is likely to confuse and deceive the public and result in substantial loss or injury to the original user. This law always is applicable even though an infringing party *uses his own name.*

For illustration, in Kay Company *v.* Morris, 171 S. W. (2d) 410, it was shown that the Kay Company adapted the name because it was short and catchy.

A man named Ray Barrett opened a competitive business on the opposite side of the street. The competitor selected the name of Ray Company partly because he had gone by that name and partly because it was short and

The Ohio Locomotive Crane Company USES A Climax R6I ENGINE TO POWER THIS OHIO CRANE

This Climax R6I, used on the crane below, is a 6 cylinder, valve-in-head engine which develops 166 h.p. at 1200 r.p.m.

Cool running is assured by the deep, widely-spaced water passages which surround the cylinder heads and full length of stroke. Operation is possible over a wide speed range without encountering criticals. The low piston speeds and compression ratios guarantee minimum upkeep cost and long life.

Maintenance is inexpensive and easy, and can be done by any local mechanic. The overhead valves make grinding simple, and there are no extremely close tolerances to be maintained.

Here is the power plant for YOUR crane, shovel, dragline, snow-plow, or other equipment.

For stationary or mobile drives; belt, chain or direct-connected, the Climax R6I gives you 166 h. p. at 1200 r. p. m.

The Blue Streak Combustion Chamber gives unusually high horsepower output on little fuel. This chamber causes complete gas mixing and more efficient scavenging, which steps up power delivery and reduces detonation and power losses.

"For High Achievement in the Production of War Material"

Climax Engineering Company

GENERAL OFFICES & FACTORY: CLINTON, IOWA

REGIONAL OFFICES: CHICAGO, ILL., DALLAS, TEXAS

AFFILIATED COMPANIES: McAlear Mfg. Co., Chicago; Hanlon-Waters Co., Tulsa

CLIMAX ENGINES are 4, 6, 8 and 12 cylinder gas engines with ratings from 40 to 495 h.p. Climax Diesel engines are made in two models rated at 22 and 44 h.p. The gas engines operate on natural gas, butane, or gasoline. The Diesels use standard grade fuel oil.

WRITE FOR INFORMATION —to Climax Engineering Company, 1809 South Fourth St., Clinton, Iowa.

catchy and easily remembered by the public.

The Kay Company sued the Ray Company and asked the court to grant an injunction to stop the use of the name Ray Company. Mr. Barrett argued that since his first name was "Ray" that he had a legal right to use it in his business. However, the higher court granted the injunction and said:

". . . The excuse assigned that 'Ray' was chosen because one of the partners was known by that name is not convincing."

Case Reopened

Although an employee agrees to accept a definite and stated compensation for an injury modern higher courts hold that the case may be reopened by the state workmen's commission if there has been a change of condition of the injured workman, or if there has been some new development which shows the former award to be either inadequate or excessive.

An important higher court case decided during the past few weeks is Barber Asphalt Corporation *v.* Industrial Commission, 135 Pac. (2d) 266.

In this case it was shown that an employe was injured during the course of his employment for Barber Asphalt Corporation. Medical examination resulted in an opinion by the medical advisory committee for the Commission that the employe's condition showed permanent partial disability of about five per cent. The employee being dissatisfied with the rating entered into an agreement of settlement with the employer which by its terms was for payment upon the basis of fifteen per cent. permanent disability as final settlement of all claims growing out of the injury, and was subject to approval by the state commission. Payment was made in accordance with the agreement.

Later the employee filed a claim for additional compensation. In this claim he alleged that he was totally disabled. After introduction of considerable testimony the higher court held void the agreement to award the employe compensation on a fifteen per cent. basis and allowed a permanent disability award. This court said:

"To be valid an agreement must conform to the provisions of the state law, the court or commission may approve an agreement only when its terms conform to the provisions of the act, and approval of an agreement which does not conform is void; so, an approval of an agreement which fixes compensation of an amount less than that allowed by the act is invalid."

Therefore, the law is well settled that a release executed by an injured employe covered by workmen's compensation insurance does not operate as a bar against a future claim filed subsequently by the employe.

It is also well established that a provision in a workmen's compensation act invalidating agreements by employees to waive rights under the act is not unconstitutional. See annotation in 47 A.L.R.

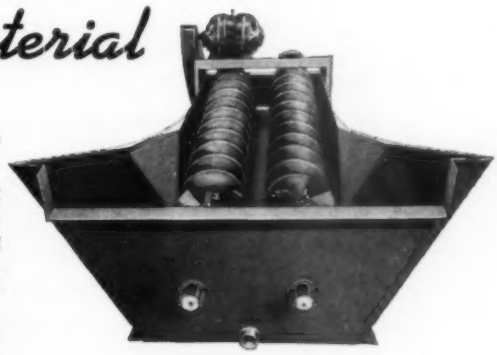
For example, in Ruehmann *v.* Consumers' Ice & Fuel Company, 192 Minn. 596, an agreement had been made by an employe with his employer that the employer would continue to pay the employe the weekly wage he had been receiving prior to the injury and the employe would do what work he was able to do and would pay to the em-

Eagle Washers Clean Gravel of Worst Clay Ball Condition Anywhere!

A Kansas user, after making an extensive survey of available equipment for removing clay balls from gravel pumped from the Kaw River near Topeka, Kansas, reports: "These clay balls carry practically the same specific gravity as the gravel itself, so it proved impractical to install equipment which used an ordinary means of separating the clay balls from the material by flotation. . . . I do not know of a deposit anywhere that has a worse clay ball condition than ours (when we are pumping in virgin material). *Your washer gets the job done and our clay ball worries have been over since the installation of your equipment.*"

EAGLE IRON WORKS
133 Holcomb Ave., Des Moines, Iowa

For Fine Material Washing . . .



Modern-day specifications calling for high percentages of 100 mesh sand make fine material washing doubly profitable. For this work, Eagle offers single and double screw Fine Material Washers in nine sizes and capacities from 30 to 180 tons per hour with flared tubs and other design features to meet both operating conditions and capacity requirements. Eagle engineers are available for suggestions on how to lower your washing costs and increase your premium sand production.

EAGLE *Specialized Sand and Gravel Equipment*
"SWINTEK" DREDGE LADDERS — SCREW WASHERS
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CLASSIFIERS — REVOLVING SCREENS
EAGLE IRON WORKS
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"SERVING INDUSTRY FOR OVER SEVENTY YEARS"

ployer the amount he received as compensation under the workmen's compensation act. Under this agreement the employee paid the amounts he received each week for a number of weeks to the employer, but then discontinued and sued the employer to recover the amount he had paid less the amount which he had received from the employer.

The court held that he was entitled to receive the full amount payable to him under the compensation act and that insofar as the agreement operated to give the employee less than the full compensation to which he was entitled under the act it was void. It was also held that the employee was entitled to retain the amount which his employer had paid him as wages during the period of disability, up to but not exceeding the reasonable value of the services rendered by him in his partially disabled condition.

Also, see the leading case of Arizona case, Red River Copper Company *v.* Industrial Comm., 58 Ariz. 203, where an injured employee applied for compensation under the state compensation law and was granted a hearing. During the proceedings it developed that the employe had signed an agreement upon taking the employment by which rejected the benefits of the state compensation act; and that this was required by the employer who represented that the employee would be covered by other insurance which was better than that provided by the act.

The court held that neither the original agreement to reject the provisions of the compensation statute nor the agreement of settlement was binding on the claimant. As to the release the court said:

"Nor could the release above set forth have any effect on petitioner's (employe's) rights under the Act, since it was not approved by the commission."

Stay Not Allowed

Contrary to the opinion of a majority the Soldiers' and Sailors' Civil Relief Act of 1940 does not grant an absolute right to a stay or delay of a suit. The act was passed to relieve those in the armed services from the strain of litigation during their period of service where the fact of their service would adversely affect their prosecution or a defense of a pending case. It was intended to prevent any advantage to the civilian litigant and disadvantage to the soldier or sailor litigant growing out of the fact that one of the litigants was in the military service.

For illustration, in Johnson *v.* Johnson, 139 Pac. (2d) 33, it was shown that the driver of an automobile negligently collided with another automobile, seriously injuring the occupants, who sued to recover damages.

Later the driver enlisted in the United States army and asked the court to grant a stay or delay in deciding the suit in view of the Soldiers' and Sailors' Civil Relief Act. However, since the driver held a liability insurance policy the higher court refused to grant the stay, and said:

"It is the theory of defendant (driver) that upon a showing that he was in military service and unable to attend on the day set, he was entitled to a stay until after the termination of the war. . . The law is inapplicable unless it is made to appear that the rights of a person in service will be prejudiced by a proceeding against him."

Questions and Answers

[Mr. Parker will be glad to answer questions regarding legal problems of PIT AND QUARRY readers. Questions should be addressed to Leo T. Parker, Legal Editor, PIT AND QUARRY.—Ed.]

Legal Editor: When may an employer be relieved of liability where an employee is injured while operating dangerous or defective machinery?—V. S. & G. C.

Answer: According to recent higher-court decisions when a workman accepts dangerous work he *assumes* the *ordinary* risk of dangers, provided the employer is not negligent in maintaining the machinery in first-class condition. If an employee observes that the machinery is defective, he is bound to immediately notify his employer, or the employer is relieved of liability. Where an employee notifies his employer that machinery is in need of repairs, the employer is obligated to immediately attend to having the repairs made, or he makes himself liable when he requests the employee to continue working until the repairs are made. Otherwise, the employee assumes the risk.

In a recent case an employee reported to the superintendent that a belt needed repairing. The superintendent promised that the necessary repairs would be made within "a couple of hours." The employee continued to operate the defective machine after the two-hour period had expired, without again notifying the employer. The belt broke and the mechanic was injured. The court held the employer not liable and explained that

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of the

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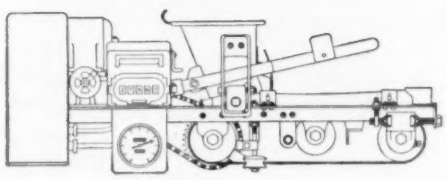


1—Records the weight fed by
- (a) printed card—both cumulative and batch
- (b) recording chart—a month's record on one roll
- (c) visual dial reading in pounds or tons

2—Remote controls
- (a) rate changed by push button station
- (b) recording attachments located in control room

3—Designs to suit your problem
- (a) two or more feeders interlocked for proportioning
- (b) metal belt for handling materials at temperatures above 250° F
- (c) magnetic pulley to remove iron from material

Write for Bulletin 43

HARDINGE

COMPANY INCORPORATED, YORK, PENNA.

NEW YORK CHICAGO SAN FRANCISCO TORONTO

where an employee reports a defect of machinery and the employer promises that it shall be repaired within a specified period, the employer is not liable for damages if the employee on his own accord continues to operate the unrepaired machinery after the time it was to be fixed.

In another case it was shown that an employee reported that a concrete mixer was defective. The foreman ordered him to proceed with his duties, promising that the machine would be fixed during the noon hour. The employee was injured before the noon hour, and the court held the employer liable for the injuries sustained.

Therefore, where an employee notifies his employer of a defect in a machine and the employer promises to make the needed repairs, the employee is entitled to compensation or damages for injuries received before the time the repairs were promised to be made. If, however, an employee notifies his employer of the defective machinery and continues to work after the time the repairs were promised to be made, the employer is not liable.

An employer is relieved of liability for injuries to workmen, as a result of defective machinery: (1) Where the defect is of such character that it should have been discovered by ordinary care on the part of the employer, and the defect was known to the employee; (2) where the employee notices the defect and fails to report it; (3) where the employee reports a defect and continues to work after the time the employer promises it shall be repaired; (4) where the employer promises to make repairs and the employee continues to work, not believing the repairs will be made; (5) where the employee reports the defect and continues to operate the machine against orders.

* * *

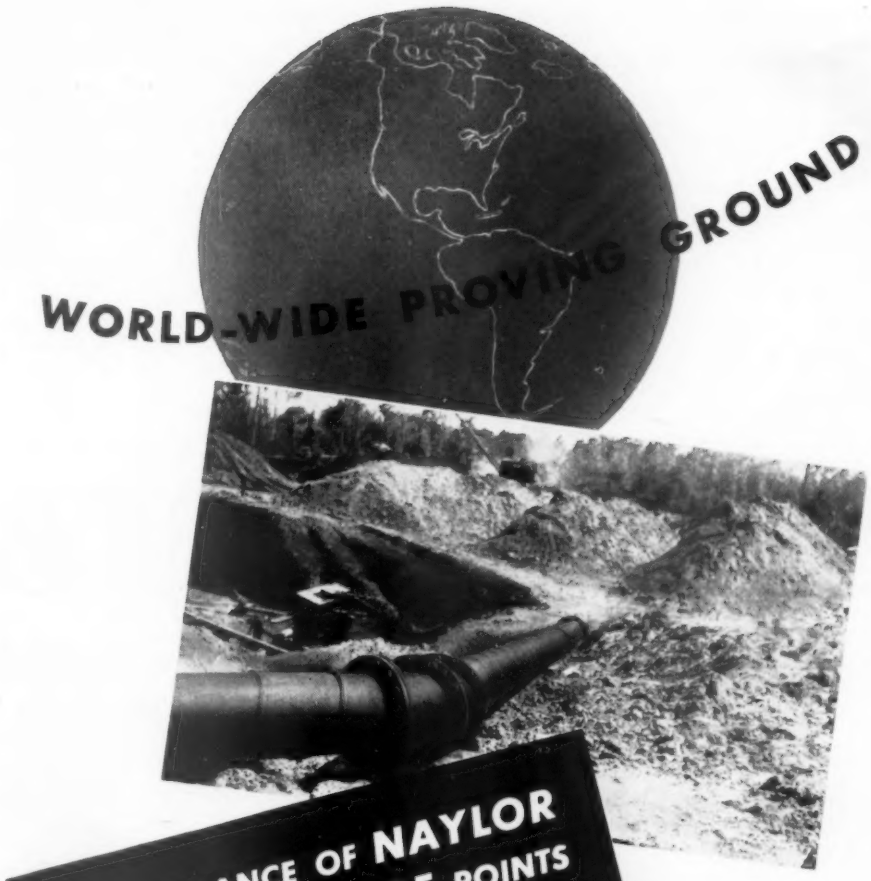
Legal Editor: When I recently purchased a new machine I explained very carefully to the salesman what work I wanted the machine to turn out. The salesman recommended a Model 10, and after installing it I find that Model 12, which is of larger capacity, is the proper size machine, and Model 10 will not perform the work. Is the seller responsible?—B. C. Company.

Answer: The law presumes every salesman to be honest, trustworthy and capable until proved to the contrary. If the character of a machine is such that a purchaser must rely upon the honesty and capability of the seller, or his salesman, to supply a machine fit for the buyer's intended work purposes, the court will imply that the seller guaranteed to supply a machine reasonably fit to do the purchaser's work. The outcome of a litigation of this nature depends upon whether the buyer relied upon the seller's good judgment to furnish a machine which would fulfill the special purpose, and whether the purchaser can prove that he explained to the seller the intended uses of the machine.

You are entitled to obtain Model 12 by exchanging your Model 10 and paying the difference between the purchase price of the two models of machines.

* * *

Legal Editor: What is the liability of a person who fails to cash checks on a bank within a reasonable time after receiving them? A few weeks ago we received a check as payment on a gravel account. This check was not deposited for several days and when it was de-



From North Africa to New Guinea—wherever there's a pipe line required to do the job—Naylor Pipe continues to demonstrate its performance advantages over ordinary light-weight pipe.

Through its exclusive Lockseam Spiralweld structure, this pipe gives you greater strength, leaktightness and safety to perform jobs normally requiring heavier-wall pipe. And along with these advantages, Naylor offers advanced methods of pipe line connection in simplified and far quicker coupling.

All these performance features can step up your production in the post-war period just as effectively as they are functioning today in war-time service.

USE NAYLOR PIPE

for Dredging • Hydraulic Sluicing • De-Watering
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Wash Water Lines • Slurry and Clay-Slip Pipe
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posited it was returned marked "No Funds". Can we collect the amount of the check from the customer?—R. S. & G. C.

Answer: Modern courts hold that all persons should present checks to their banks without delay. If, for instance, the bank on which the check is drawn fails, the holder of the check can not recover other payment from the maker, if he could have presented and received payment on the check within 24 hours after he accepted it.

While it is not customary to do so, the courts require that the holder of a check present it *immediately* to the bank on which it is drawn. In other words, *any* delay caused by depositing in a bank different from the bank on which it is drawn, which results in the check having to go through a clearing house, is at the risk of the holder. However, the fact that a check is returned marked "No Funds" does not prevent you from suing the customer and recovering the amount of the check. This is true because your failure to promptly deposit the check for payment does not relieve the debtor from further payment, provided your negligence in not promptly depositing the check does not result in financial loss to the debtor.

* * *

Legal Editor: Is it possible for us to hold a salesman personally liable on a contract made by him for his employer? In this case the salesman's employer has discontinued his business—R. M. C.

Answer: Agents, employees, and salesmen are legally classified as "special" and "general". An employer is liable for all acts and contracts made by a "general" agent within the scope of the employment. However, an employer is not liable for the acts of a special agent unless special authorization is given such agent for contracts made by him or unless he was authorized to make valid contracts, or the employer later accepted or approved the contract submitted by the salesman.

However, the law is established that any salesman or employee *who exceeds his authority* is personally liable for contracts under the following circumstances: (1) When he intends to bind himself; (2) when, without knowledge of the other party, he intends to bind his employer but signs the contract with his own name; (3) when he assumes authority to make a contract for his employer but actually has no authority; (4) when the employer refuses to ratify the contract made by his employee without proper authority; (5) when the employer gives the employee consent to make a contract and promises that he will fulfill the agreement and the employee, when making the contract, fails to mention the name of his employer and later the latter testifies that he did not give authority to his employee who can not prove that authority was actually given to him.

* * *

Legal Editor: Is it possible for any other firm to obtain a copyright on photographs that we use for advertising purposes, if we fail to obtain copyrights? Can a trade-mark be used to protect our advertising pamphlets against others using them or our ideas? How long does a copyright and trade-mark run, and what is difference between them?—P. C. M.

Answer: Unless the original author copyrights a photograph he does not ordinarily have a legal right to sue and recover damages from an infringer unless evidence is introduced showing that by false representation the original author was damaged in some manner. However, the person who appropriates an uncopyrighted photograph has no legal right to obtain a copyright on it.

A trade-mark may be registered in various states or in the United States Patent Office. In order that a trade-mark is capable of being registered in the United States Patent Office the applicant must take oath that previously his merchandise has been shipped from one state into another. In other words, interstate commerce is essential when obtaining a United States trade-mark. A trade-mark may consist of your name or any other mark which is original and not presently registered by another dealing in the same class of merchandise. Its term is for 21 years and may be renewed indefinitely at the end of each period. The cost is nominal and in consideration of the protection afforded it is essential.

A copyright issues for 28 years and may be renewed for another 28 years. A patent can not be renewed. A trade-mark will not prevent another from copying your advertising pamphlets as only a copyright entitles you to sue for copyright infringement.

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HYDRAULIC HOISTS and DUMP BODIES

GIVE DEPENDABLE SERVICE ON ALL KINDS OF JOBS

Hercules Removable Side Rub Rail Body with hinged rear corner posts. Available in many sizes.

Hercules High Dumper—Power up, power down with 78° dumping angle. Equipped with 12 ton capacity hoist.

HERCULES HYDRAULIC BOOSTER HOIST

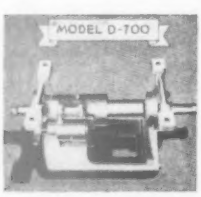
Makes any truck a Dump Truck

Install HERCULES DOUBLE-ARM HYDRAULIC HOISTS under your platform, stake, express or special bodies, which are now idle. Unload the easy way!

This is the Model KXE Hoist, with 6″ cylinder, for bodies up to 12 feet long. Body reinforcing plate and steel sills included. Control valve is operated from driver's seat.

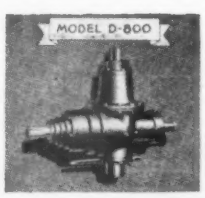
USE THE HERCULES SPLIT-SHAFT POWER TAKE-OFF

To operate any truck-mounted equipment



Direct (D-700 Series), Side (D-800 Series) and Dual Drive (B) models are available for operation of almost every possible type of truck-mounted equipment, either singly or in combination.

Recommendations and complete specifications upon request.



HERCULES STEEL PRODUCTS CO.

GALION, OHIO

The War Isn't Over
BUY ANOTHER BOND

TRAFFIC News Digest

CENTRAL FREIGHT ASSOCIATION

Docket 76225 (1)—Industrial sand subject to Columns A, B and C ratings and minimum weights as per usual description. Establish on, from Grand Haven, Muskegon and Rosy Mound, Mich., to Depew, Medina and Silver Creek, N. Y., Description A: 297c; B: 327c; C: 297c per net ton. Subject to ExParte 148 increase (suspended).

Docket 76226 (2)—Industrial sand subject to Columns A and C ratings and minimum weight as per usual description. Establish on, from Black's Siding, Michigan.

(Rates in cents per net ton)

	Proposed Rates	
	A	C
Batavia, N. Y., Median, N. Y.	242	237
Depew, N. Y., Lancaster, N. Y.	231	220
Olean, N. Y., Rochester, N. Y.	264	264

(All rates subject to ExParte 148 increase (suspended).)

Docket 76227 (2)—Limestone, ground or pulverized, unburned, carloads, minimum weight 60,000 pounds. Established on, from Hannibal, Mo., Marblehead and Quincy, Ill., to Tecumseh, Mich., 325c per net ton, *via* Wabash R. R., Napoleon, Ohio, or Adrian or So. Adrian (Page), Mich., D. T. & I.

Docket 76229 (2)—Sand (except blast, core, engine, filter, fire or furnace, foundry, glass, grinding or polishing, loam, molding or silica) and gravel, in open-top cars only, carloads. Establish on, from Marion, Ind., to Goldsmith, Ind., 79c per net ton, *via* N. Y. C. & St. L. R. R. direct.

Docket 76236 (1)—Sand (other than ground or pulverized or molding, bonded (naturally or otherwise), and gravel, in open top cars without tarpaulin or other protective covering. Carloads. Establish on, from New Martinsville, W. Va., to Bergoo, W. Va., 198c, per net ton, subject to ExParte 148 increase (suspended), *via* B. & O. R. R.—Elkins, W. Va.—W. M. Ry.

Docket 76245 (1)—Slag, carloads, minimum weight 90 per cent. of marked capacity of car, except when car is loaded to full cubical or visible capacity, actual weight will apply. Cancel Item 2650, naming rate of 155c per net ton on, from Chicago, Ill. (and points taking same rates) to Indianapolis, Ind., class rates or intermediate rates to apply.

Docket 76254 (2)—Lime, common, hydrated, quick or slaked, also agricultural and fluxing, carloads. Establish on, from Speed, Ind., to Trafalgar, Ind., 13c, minimum weight 30,000 pounds; 10c minimum weight 50,000 pounds.

Docket 76257 (2)—Sand (all kinds), and gravel, in open top cars, carloads, minimum weight 90 per cent. of marked capacity of car, except when car is loaded to full cubical or visible capacity, actual weight will apply. Establish on, from Chardon, Ohio, to Lancaster, Ohio, 171c per net ton, subject to ExParte 148 increase, suspended. Route: *Via* B. & O. R. R., Columbus, Ohio—C. & O. R. R., B. & O. R. R., Uhrichsville, Ohio—P. R. R.

Amsco Nose Ringshields *Prevent Frequent Shutdowns*

More burned clinker comes from kilns equipped with Amsco Shielded Nose Rings because they seldom have to be shut down to rebuild the discharge end. The reasons are:

(a) Design—Each segment of the Nose Ring can expand and contract *independently* — so the diameter does not enlarge when brought to operating temperature and the bricks do not fall out. Nose Ring is covered by small protecting shields that can be replaced quickly and economically without cooling down completely to remove brick. Nose Ring lasts indefinitely.

(b) Material — Amsco Alloy is a high temperature metal; does not "grow" like iron and steel. Lasts several times longer. No noticeable scaling under normal conditions.

Send kiln diameter and a brief description of your present nose rings to obtain details of Amsco Alloy Nose Ringshields. (Pat. 2,321,217)

With Amsco Alloy—plus good design—*you can't go wrong.*

K-7—Partially assembled Nose Ringshield.

K-22—Nose Ring Segments and Shields that form the Amsco Nose Ringshield.

K-21 — Completely assembled Nose Ringshield. This one was designed for extremely severe service, producing dolomite.

Amsco No. 217 hard-surfacing welding rod for use where temperatures are high, described in Bulletin 941-W.

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AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Illinois
AMERICAN Brake Shoe COMPANY
FOUNDRIES AT CHICAGO HEIGHTS, ILL.; NEW CASTLE, DEL.; DENVER, COLO.; OAKLAND, CALIF.; LOS ANGELES, CALIF.; ST. LOUIS, MO.
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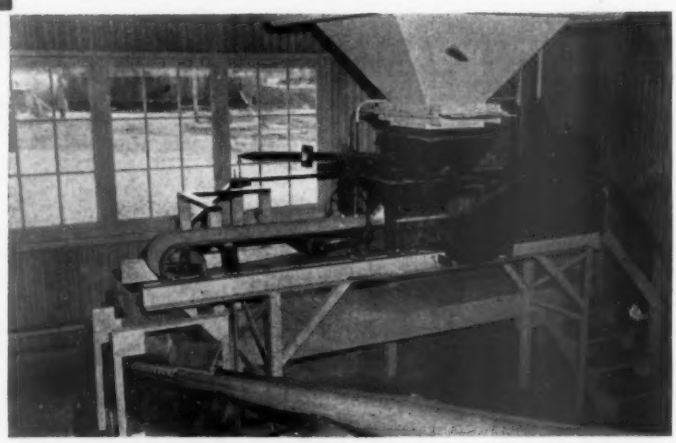
OVER 1000 ★ Serving Industry

SCHAFFER POIDOMETERS

. . . for weighing, feeding and proportioning raw materials have a uniformly high record in both war-operated and industrial plants.

With the aid of SCHAFFER Poidometers, producers of lime, cement and aggregate are able to meet expanding schedules on a lower cost basis, and more easily maintain exacting product standards.

Write for Catalog No. 5



One of several Poidometers weighing and feeding dolomite to kilns at Ludington, Mich., plant of Dow Magnesium Co.

SCHAFFER POIDOMETER CO., 2828 Smallman St., PITTSBURGH 22, PA.

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BUILDINGS OF ALL TYPES—
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Retaining Walls
Reservoirs
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Cement Plants

YOU CAN PROFIT BY OUR TWENTY-FIVE YEARS EXPERIENCE

Our engineers and construction crews are available for quick construction

E. C. MACHIN COMPANY
BUILDERS
Commonwealth Building—Allentown, Pa.

Docket 76252 (1)—Sand, carloads. Amend agency and individual lines' tariffs, publishing rates on, from the so-called Vassar Group to Points in Official Classn. territory (a) by eliminating Wampson and Vassar, Mich., from the so-called Vassar Group; (b) by adding Banksand, Mich., to the so-called Vassar Group, applying the same rates therefrom as are currently in effect from Watrousville, Mich.

Docket 76258 (2)—Sand (except blast, core engine, filter, fire or furnace, foundry, glass, grinding, polishing, loam, molding and silica) and gravel, in open top cars, carloads. Establish on, from Riverton, Ind., to West Dana, Ind., Raven, Scotland, Chrisman, Cherry Point, Barnes, Metcalf, Hume, McCown, Newman, Murdock, Camargo (Tuscola), Ill., 111c; to Picklin, Garrett, Atwood, Pierson, Hammond, Burrowsville, Lintner, LaPlace, Casner, Long Creek and Decatur, Ill., 124c per net ton.

Docket 76278 (2)—Crushed stone and stone screenings, in bulk, in open top cars, carloads. Establish on, from Middlepoint, Ohio, to West Unity, Ohio, 99c; Pulaski, Ohio, 94c; Coldwater, St. Hendry, Ohio, 88c; Jackson, Mich., 127c; Clarks Lake, Mich., 123c; Cement City, Addison Jct., Manitou Beach, Rollin, Mich., 118c; Hudson, Prattville and Waldron, Mich., 112c per net ton, *via* P. R. R., Van Wert, Ohio, N. Y. C. (C).

Docket 76272 (2)—Roasted dolomite, carloads, minimum weight 100,000 pounds. Establish on, from Northwestern Ohio to Geneva, Utah, 1105c per net ton.

Docket 76279 (2)—Crushed stone, carloads. Establish on, from Marble Cliff, Ohio, to points in West Virginia on the Guyandotte Branch of the C. & O. Ry., rates as shown in Exhibit A.

Exhibit A

Crushed stone, having value for construction purposes only and not suitable for agricultural or chemical purposes, in bulk in open top cars.

From Marble Cliff, Ohio
(*Rates in cents per net ton.*)

To (W. Va.)	Prop.
Sheridan and Branchland	176c
Hubball	176c
Midkiff, Ranger, Lattin, Gill, Sand Creek, Harts, Ferrellsburg	187c
Big Creek, Kitchen, Chapmanville, Phico, Peck Mills, Heulawson, Peach Creek, Logan, Stollings, Lyburn, Wilbur, Earling, Man	198c

Docket 76281 (1)—Limestone, ground or pulverized, unburned, carloads, minimum weight 60,000 pounds. Establish on, from Piqua, Ohio, to New York, N. Y,. 501c per net ton.

Docket 76287—Crushed stone and sand and gravel, carloads. Cancel present rates on, from Monon, Ind., Thornton, McCook, Bellwood, Joliet, Lehigh and Plainfield, Ill., to C. I. & L. Ry. stations, Lowell, Shelby, Thayer, Rose Lawn and Fair Oaks, Ind., also from Lehigh, Ill., Lafayette and Korn, Ind., to Shelby, North Hayden and Belshaw, Ind., and reinstate prior rates. Proposed rates, as shown in Exhibit C.

Docket 76291 (2)—Crushed stone, in bulk in open top cars, carloads. minimum weight 90 per cent. of the marked capacity of car, except when car is loaded to full cubical or visible capacity, actual weight will apply. Establish on, from Marion, Ohio, to Findlay, Ohio, rate of 88c per net ton.

Docket 76299 (2)—Sand (except sand, molding, bonded (naturally or otherwise), and except ground or pulverized sand), and/or gravel in open top equipment without tarpaulin or other protective covering. Carloads. Establish on, from Follansbee, W. Va., to Aliquippa, Pa., of 121c net ton, subject to ExParte 148 (suspended).

Docket 76285 (2)—Cement, viz.: Common, hydraulic, Masonry, mortar, natural or portland, carloads, minimum weight 50,000 pounds, unless marked capacity of car is less in which cases marked capacity of car will be the minimum weight, but not less than 40,000 pounds, also cement clinker, carloads, minimum weight 50,000 pounds. Establish rates on from Middle Branch, Ohio to points on B. & O. R. R. and Monongahela Ry. in West Virginia, including Brave, Pa., as shown in Exhibit F. Secs. 1 and 2.

ILLINOIS FREIGHT ASSOCIATION

Docket IRC 511-181—Sand (other than bank, blast, core, engine, filtering, fire or furnace, foundry, glass, grinding or polishing, loam, molding, or silica), from Arenzville, Ill., to Jerseyville, Ill. Present: Class or Combination. Proposed: $1.08 net ton, to expire Dec. 27, 1944.

SOUTHERN FREIGHT ASSOCIATION

Docket 31724 (carrier)—Cancel rates on sand, gravel, crushed stone, etc., as described in Item 300 of S. F. T. B. Trf. 388-F, from stations in Ill., Ky., Miss. and Tenn. to Bemis, Tenn., where such rates are higher than the rates now published to Jackson, Tenn.

SOUTHWESTERN FREIGHT BUREAU

Docket 34268 (2)—Cement, Monroe, La., to Arkansas and Louisiana. To cancel all rates on cement, viz.: hydraulic, masonry, natural or portland, in straight or mixed carloads, published in Items 130, 135, 140 and 145 of MO. PAC. Tariff 2791-K and similar items of other individual lines' issues, if any, account being obsolete.

Docket 34296 (1)—Crushed or broken stone, Cairo, Ill., to Marlo, Mo. To establish a rate of $1.00 per net ton on crushed or broken stone, from Cairo, Ill., on traffic originating south of the Ohio River, to Marlo, Mo., subject to Tariff X-148 (suspended).

Docket 34222 (1)—Cement, also dry building mortar, Memphis, Tenn., to points in Missouri. To establish rates on cement, viz.: hydraulic, masonry, mortar, natural or portland; also dry building mortar, straight or mixed carloads, from Memphis, Tenn., to points in southern Missouri, on and south of the St. L. S. F. from St. Louis, Mo., through Springfield, Monett and Seligman, Mo., to the Arkansas state line, on basis of I. C. C. Docket 8182 Scale 111 and formula.

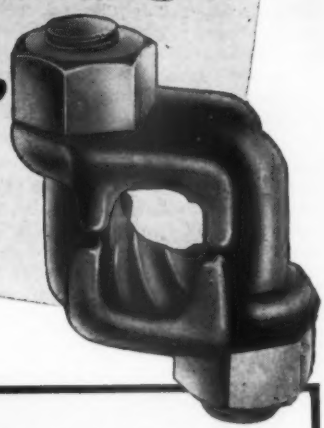
TRANSCONTINENTAL FREIGHT BUREAU APPLICATION

Docket 1813 (shipper)—Cement, natural, hydraulic or portland, carloads, W. B.: Request for rate 37c per 100 pounds, minimum weight 60,000 pounds, from Boettcher, Portland and Concrete, Colo. (Group J), to Wendover, Utah (Rate Basis 2), with routing from Boettcher *via* U. P. R. R. Salt Lake City, Utah, thence W. P. R. R. and from Portland and Concrete *via* D. & R. G. W. R. R., Salt Lake City, Utah, thence W. P. R. R., Trf. 1.

TRUNK LINE ASSOCIATION

Docket 42356 (increase) (shippers)—Cement, carloads, per Note 1 of N. Y. C.

"FIST-GRIP" CLIPS HELP MAKE "FIRST CLASS" WORKERS



The extra safety provided in Laughlin "Fist-Grip" Safety Clips helps inexperienced workers to do faster work with fewer accidents. They can't be put on backwards, because their saddles are identical . . . 100% foolproof.

In every sort of test by major rope companies, leading technical laboratories and in actual use by well-known industrials, contractors, etc., Laughlin's "Fist-Grip" Clips have proved their rope and labor-saving features *plus* extra safety. Write for folders describing competitive tests and insurance company approval.

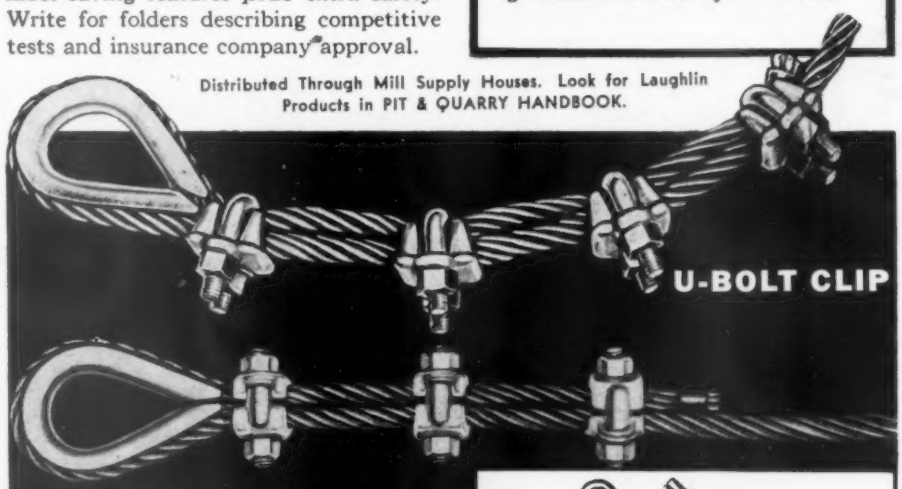
3 ADVANTAGES OF "FIST-GRIP" CLIPS

1. ***Saves Manpower...*** less work to apply, fewer clips to apply.
2. ***Saves Metals...*** 25% fewer clips do the job better, saving steel; no crushed rope ends, saving rope; no battered threads . . . nuts are flush.
3. ***Saves Time...*** fewer clips speed the job; nuts on opposite sides—easier, faster tightening with any type wrench.

Congratulations to you men in charge of safety programs. You've done a remarkable job in these abnormal times.

Laughlin "Fist-Grip" Safety Clips fit right in with your plans. Even green men work safely with them.

Distributed Through Mill Supply Houses. Look for Laughlin Products in PIT & QUARRY HANDBOOK.



"FIST-GRIP" CLIP

Fewer Safety Clips hold rope straight in smooth, vise-like grip.

LAUGHLIN HOOKS ARE ALSO MUCH SAFER

These rugged hooks with their stout-springed latches securely trap the slings . . . no accidental slipping or jolting off.

FORGING A SHARE IN VICTORY

THE THOMAS LAUGHLIN Company
PORTLAND 6, MAINE

R. R. Tariff I. C. C. No. 298 from Hudson, N. Y., to Eyersgrove and Millville, Pa., 19c per 100 pounds, in lieu of present rate of 18c. Reason—To correct error and place rates on proper basis.

Docket 42357 (shippers)—Limestone, ground or pulverized unburned, minimum weight 60,000 pounds from Kaylor, Pa., to points in Pennsylvania as per exhibit, copy of which will be furnished on request. Rates on basis of I. C. C. Docket 25220. Reason—Comparable with rates from and to other points.

Docket 42392 (shippers)—Cement, (common, hydraulic, masonry, mortar, natural or portland), carloads, minimum weight 50,000 pounds, except when for carrier's convenience cars of less capacity are furnished in which case minimum weight will be marked capacity of car furnished, but not less than 40,000 pounds, except on cement in bulk, minimum weight to be 50,000 pounds, from Ironton R. R. stations to Northampton & Bath R. R. stations, as per Exhibit A, proposed rates reflecting cement shippers "Trucking scale" for actual point to point distance. Reason: Comparable with rates applying from and to other points.

WESTERN TRUNK LINE ASSOCIATION

Docket X-E-41-636—Agricultural limestone, ground or pulverized, in bags, barrels or in bulk, carloads, from Pearl, Ill., to stations on the Alton R. R. in Missouri. Proposed—Mileage scale as published in Item 90-A, WTL Tariff 237-E for distances 30 miles to 240 miles (single line).

Docket D-25-155—Plaster and stucco, carloads, from Rapid City, Black Hawk, and Piedmont, S. D., to C. & N. W. stations in Wyoming, Index No. 843 to 915, inclusive, of C. & N. W., G. F. D. No. 16381-E. Minimum weights: Present—30,000 pounds. Proposed—40,000 pounds. (By shipper.)

Docket X-E-41-637—Limestone, crushed, ground or pulverized, unburned, carloads, minimum weight 60,000 pounds, from Louisiana, Mo., and Pearl, Ill.

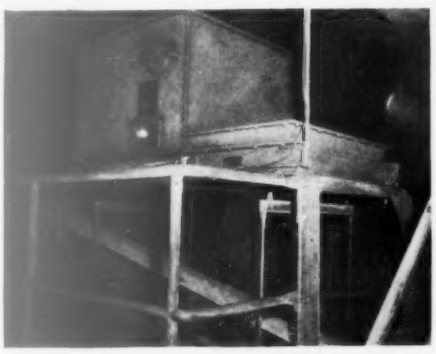
To	Proposed
Baltimore, Md.	$5.45
Harrisonburg, Va.	5.01
New York, N. Y.	6.11
Philadelphia, Pa.	5.67
Washington, D. C.	5.34

Docket E-41-638—Crushed stone, from Sioux Falls, S. D., to Osceola, Nebr. Rates: Present—15c per 100 pounds, minimum weight 90 per cent. of marked capacity of car, but not less than 40,000 pounds. Proposed—Cancellation of the present rate, allowing available combination to apply in lieu thereof.

Docket E-41-639—Sand (glass), carloads, minimum weight as provided in Item 3540 of WTL Tariff 18-R, from North Jefferson, Mo., to Augusta and Independence, Kan. Rates—Present 241c per ton of 2,000 pounds, to Augusta, Kan.; 267c per ton of 2,000 pounds to Independence, Kan. Proposed—Cancel, class basis to apply.

Docket E-41-640—Limestone, crushed or ground as described in Item 5040 of WTL Tariff 18-R, from Louisville and Weeping Water, Nebr., to St. Paul and Duluth groups. Proposed—Cancel present rates permitting rates in Items 3005 to 3010 to apply in lieu thereof.

Docket E-43-176—Stone (rough quarried) paving blocks also crushed stone as described in Item 3910 of WTL Tariff 18-R from Wisconsin stations to Shannon, Kan. Rates—Present, 16c per 100 pounds. Proposed—Cancel, class basis to apply.



LOADING
1000 Tons in 24 Hours at
LIBERTY LIMESTONE
with the
WEIGHTOMETER
Read the Story in This Issue
MERRICK SCALE MFG. CO., Passaic, N. J.

Brownhoist Buckets for faster material handling

The deep-digging, hungry mouths of Brownhoist Clamshell buckets speed up the handling of coal, ore, gravel, dirt, cinders, clay, etc. Large sheaves reduce rope wear and maintenance. Sturdy construction and latest design insures long life. Available in rope-reeve, power-wheel and link type. Industrial Brownhoist Corporation, Bay City, Michigan. Offices in New York City, Philadelphia, Pittsburgh, Cleveland and Chicago.

AFTER—
THE WAR
IS OVER

New York City's Post-War Plans Making Progress Thirty-eight million dollars is the estimated cost of 850 additional post-war construction projects for New York City approved by the New York State Postwar Public Works Planning Commission. For paying one-half the cost of making the plans the commission appropriated $510,270. The commission has now approved a total of 1,608 projects for the city and their aggregate cost is estimated at $73,000,000. One million dollars has been allocated for the preparation of the plans.

* * *

3,000,000 Houses Needed in Ten Post-War Years A survey of housing needs in 376 cities in all parts of the country shows that the number of houses that might be built after the war would be about 300,000 annually

in each of the first ten post-war years. This is one house for every 227 families, or 4.4 houses per 1,000 of urban population—a total of approximately 303,000 units—for the cases (approximately one-half of the urban population of the country) covered by the survey.—(Forty-second semi-annual survey, National Association of Real Estate Boards, May, 1944.)

* * *

Government Aid in Post-War Housing

". . . the median income of our urban population is well under $2,000 a year. . . . There is stark reality in the fact that no new homes were built for families earning less than $1,000 a year; and adequate housing was constructed for only a fraction of one per cent. of families earning from $1,000 to $1,500 annually.

"It is not enough to say that this situation is solely the concern of government. No matter where the responsibility lies, housing must be provided. It must be carefully planned and properly financed. *It can be done.*

"The task will be accomplished in some part by individual initiative. But the undertaking is so vast that there must be a joint effort in which the federal government, states, municipalities, banks, labor unions, insurance companies, and industry take an active part."—(Henry J. Kaiser at the Conference on Post-War Housing, Chicago, March, 1944.)

* * *

North Dakota Plans Spending of $8,000,000

The State of North Dakota's highway department has drawn plans for the improvement of 400 miles of state roads. The work will include grading and resurfacing, incidental bridges and grade separations and will cost $8,000,000. The survey work on an additional 140 miles of highway has already been completed, and a large part of the necessary rights-of-way has been acquired.—(J. S. Lamb, state highway commissioner, at annual meeting of North Dakota Highway Contractors' Association, February, 1944.)

NEW MACHINERY and SUPPLIES

● Gas Analyzer

A significant demonstration, one probably never previously performed, was shown by a new gas analyzer on display at the recent Chemical Show in New York City. This new industrial instrument was built for installation in one of the nation's large metallurgical plants where it will be used for determining the percentages of O_2, CO_2, CO and H_2 simultaneously, and continuously recording the amounts on a single chart. For demonstration purposes at the show, only a small Bunsen-burner flame was used and visitors were invited to investigate combustion conditions in all sections of the flame. Continuous records immediately indicated the varying percentages of four different gases in any chosen zone in the flame. Explorations were easily made with a quartz sampling nipple connected to the analyzer by a flexible tube.

Chemists and other engineer-executives will find much of interest in this new industrial 4-point gas analyzer. It provides simultaneous analysis and continuous graphic record of the amounts of oxygen, carbon dioxide, carbon monoxide and hydrogen in a sample of combustion products. Chemicals, fragile glassware and moving parts in the analyses unit are eliminated. The instrument is useful in processes wherever knowledge of the amounts of the gases mentioned is required. Its use enables close control in chemical processes, oil refining and in the operation of various types of kilns, inert gas producers, furnaces in the metallurgical industry and other combustion processes.

The complete analyzer operates directly from the alternating-current supply line. The recorder may be located at any required distance from the sampling point and the instrument can be furnished with contacts for operating warning signals or to actuate various control circuits.

In theory the instrument accomplishes analysis by direct comparison of thermal-conductivity of the sample with that of a reference gas or by comparison of thermal-conductivity of the sample before and after chemical absorption or combustion.

AMAZING DEVICE
MAKES WHEELS PULL

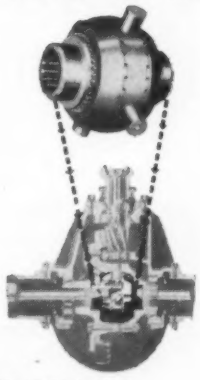
INSTALLS easily in place of conventional differential . . . stops spinning of one wheel which normally stalls a vehicle in deep sand, soft fields, mud, muck, snow or on ice, because both wheels must rotate when power is applied.

Keep truck wheels moving . . . save on gas, oil, tires, chains, time and manpower. Tens of thousands in war service for the United States and Canada.

Models readily available for the following 1½-2 ton single axle trucks: Chevrolet, Ford, G.M.C., International, Reo, Studebaker.

Available with Limitation Order Certificate L-158.

THORNTON *Automatic-Locking* DIFFERENTIALS



TEAR OUT & MAIL

Send for your catalog *today.* ➡

THORNTON TANDEM CO.
8769-E GRINNELL AVENUE • Plaza 8700
DETROIT 13, MICHIGAN

Make Big Trucks Out of Little Ones with the THORNTON *Four-Rear-Wheel* DRIVE

In U. S.: Sold by TRUCKSTELL DISTRIBUTORS
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THORNTON TANDEM CO.
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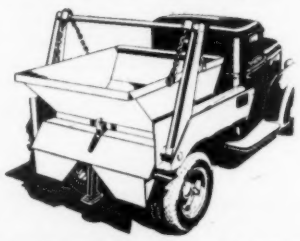
Please send me data on your *Automatic-Locking* Differential.

Name.....
Address.....
City.....*State*.....
Make and Model.....*Year*.....

Modern Cycle of *HIGH SPEED* Rock Handling

Brooks
LOAD LUGGER

for LOADING, HAULING, DUMPING



All your truck needs is a Load Lugger and "a litter of bodies" (detachable dump buckets) to increase its efficiency, and make it the speediest type of material handling unit for hauling rock from quarry to crusher, handling rip-rap and disposal of overburden.

Fits on any standard chassis without altering the frame.

Only 15 seconds for loading or dumping bucket.

Write for Catalog No. 44

106 Davenport Road, Knoxville 8, Tenn.
Distributors in All Principal Cities

Brooks **EQUIPMENT AND MFG. CO.**

Protection from Burn-Outs with
PYRASTEEL

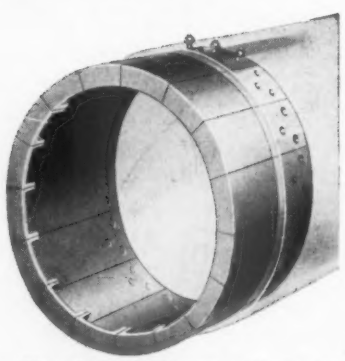
KILN ENDS

Why run the risk of kiln-end "burnouts" that cause serious shutdowns and costly repairs:

Play safe by installing PYRASTEEL Segmental Kiln Ends at both the *discharge end*, as illustrated . . . and also at the *feed end* of your cement kilns.

PYRASTEEL gives long and dependable service at high temperatures . . . as proved in scores of installations throughout the industry.

Write for Bulletin of this Heat-Resisting Alloy



Showing discharge end of cement kiln fitted with PYRASTEEL Segmental Kiln Ends.

Unit segments are easy to install or replace

CHICAGO STEEL FOUNDRY COMPANY

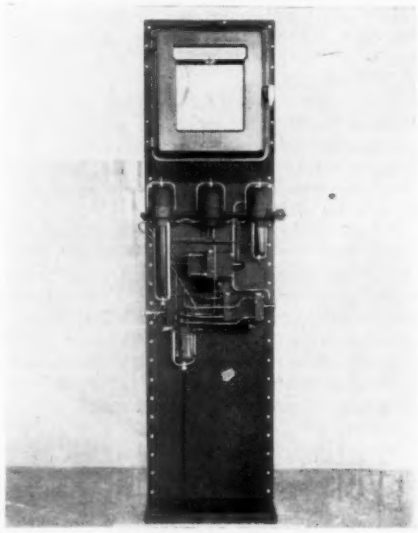
PYRASTEEL for high temperatures

KEDZIE AVE & 37TH ST.
CHICAGO 32, ILL.
Makers of Alloy Steel for 30 Years

EVANSTEEL for strength

This principle of operation allows units to be assembled to meet many special problems. In the operation of a typical unit a continuous sample of the gas is drawn into the analyzer by means of a water bubbler-aspirator. The exact detail of the analysis procedure varies with the constituents of the sample but may involve a chemical absorption and/or combustion. The aspirator mentioned above not only draws in the sample gas but meters it, as well as the air which may be required for combustion in the analysis procedure.

In all applications the results are recorded directly without any corrections or interpolation of any kind. The upkeep



Industrial gas analyzer.

required is of a routine nature and does not require the services of a technically trained man.

The recorder is automatically connected to the circuit of each analysis cell in succession, the duration of each connection being one minute. There is no additional time lag between points because the gas sample flows continuously through all cells.

A continuous record of the analysis is provided on a 10-inch strip chart, and the four different registrations (one for each gas) are shown by different colors and numbers on the chart.

The instrument is a development of the Cambridge Instrument Company, Inc., New York City.

● Truck Accessories

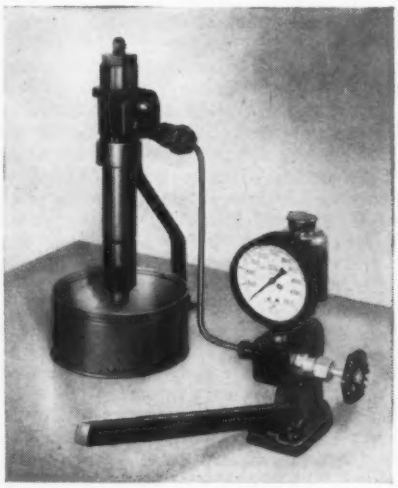
Announcement has been made of the incorporation at Cleveland of the Truckstell Manufacturing Company, a stockholder-distributor organization consisting of approximately 40 national distributors of truck equipment.

At the incorporation meeting plans were laid for the development and manufacture of new equipment and for expansion of facilities to handle additional lines of manufacturers needing the service of such a national distributor organization. Present lines now distributed include: Eaton 2-speed axles; Thornton 4-rear-wheel tandem drives; Thornton automatic-locking differentials; Truxmore third axles; Clark heavy-duty axles; Clark booster engine conversions; Clark heavy duty cast wheels; Watson auxiliary transmissions and Champion safety gas tanks.

● Nozzle Tester

Operators of Diesel-powered equipment will be interested in the development of a compact, portable nozzle tester for use on fuel injectors, according to an announcement by the Aircraft & Diesel Equipment Corporation.

The many uses of this low-cost equipment, it is stated, include the checking of injector opening pressure, spray pattern, stuck needle valves and injectors in the engine. Among the advantages listed are



Portable nozzle tester.

the speed and accuracy of the tests, the flexibility of use, simplicity of operation, and the elimination of possible damage to engine.

A special bulletin presents full details including sectional and analytical drawings of this Adeco hand test pump, together with illustrations of various adaptor tubes for testing the various makes of injection equipment. Copy of this bulletin will be sent upon request to Aircraft & Diesel Equipment Corporation, 4414 North Ravenswood Avenue, Chicago 40, Illinois.

● Lubricator

To help in the conservation of precious machinery, the Gray Company, Inc., Minneapolis, has announced a new bucket pump called the "Block Buster" for lubricating trucks, quarry equipment, industrial machinery, etc. This pump will handle all heavy duty lubricating jobs easily and quickly, the maker declares. It has several unique mechanical features and was designed to withstand hard "on-the-job" servicing.

A few of the important features include an easy-operating, double-acting pump developing 4,000-pound pressure; a hardened steel, precision ground piston; a simple, positive foot valve; an 18-gage seam-welded container with an ingenious pump-support bracket which keeps the pump from being completely removed when filling; and a strong carrying handle which acts on a large stud bolt to hold the cover and pump in position on the container. The conical-shaped hopper bottom automatically feeds all the lubricant in the container to the foot valve and prevents channeling and loss of prime.

The unit can be obtained with a 5½ or 10½-foot hydraulic adapter-equipped hose assembly, giant buttonhead coupler-equipped hose assembly, or standard buttonhead coupler-equipped hose assembly.

Bucket-pump lubricator.

● Tractor Wagon

The Mississippi Wagon, a high-capacity haulage unit for quarries, contractors, sand-and-gravel producers, etc., is now in production, according to the maker, the M-R-S Manufacturing Company of Jackson, Mississippi. Three models of 9½, 10½, and 15 cubic yards heaped capacity are being manufactured.

The Mississippi Wagon has maximum tractive ability for bad going at slow

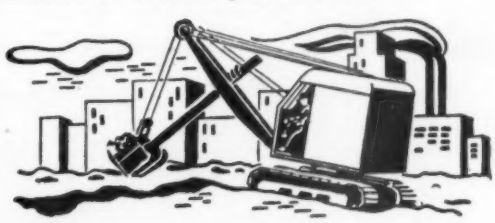
Raising a BLISTER—

Osgood Dependability Helps Speed Construction on Military Hangars

"Somewhere in England" this blister-type hangar is affording weather protection for the men and materials of our engineer troops. And in the foreground is a construction "warhorse" familiar to Army engineers the world over . . . a dependable Osgood shovel.

Whatever and wherever the job—slogging through mud . . . chipping a runway in the flint-like coral of Pacific atolls . . . hacking a road out of African jungles . . . battling the frozen ground along the Alaskan Highway . . . plugging away at the common-place jobs here at home—rugged, powerful Osgoods are giving memorable wartime performance.

This global service, besides helping to win the war, is an exhaustive proving ground for better peacetime excavating equipment for you.



THE GENERAL EXCAVATOR COMPANY
GENERAL CRANES, DRAGLINES AND SHOVELS
DIESEL, GAS, ELECTRIC

Associated with The General Excavator Company
OSGOOD
THE OSGOOD COMPANY • MARION, OHIO

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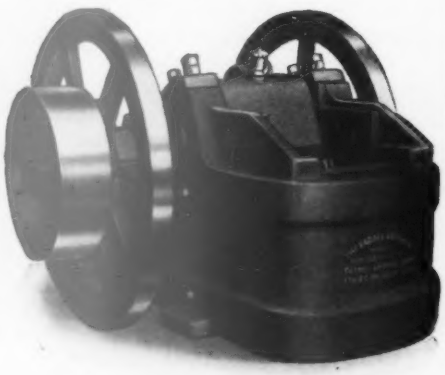
SHOVELS, DRAGLINES CRANES
CRAWLER & WHEEL MOUNTS
DIESEL, OIL, GAS, ELECTRIC

FARREL BACON CRUSHERS

Complete plants designed and equipped, including Screens, Elevators and Conveyors. Machinery for Mines and Rock Quarries, Sand and Gravel Plants. Engineering Service.



EARLE C. BACON, Inc.
17 John St. New York, N. Y.

One of the high-capacity tractor wagons.

speed without paying the penalty of the pounding and surging of the heavy trailer on the tractor during the high-speed portion of the cycle, the maker points out. This is accomplished by the operator with a finger tip control that actuates the hydraulic cylinder between the rear of the tractor and the front of the trailer, thereby causing the transfer of sufficient weight from the trailer to the tractor to secure the maximum tractive effort of the tractor. No part of the weight of the loaded trailer is on the tractor except when needed for traction purposes.

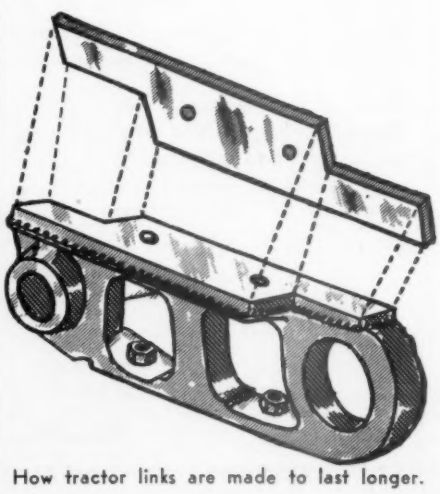
The tractor can be quickly detached and used for other work, such as pulling sheepsfoot rollers, rubber tired rollers, etc.

Only 12 pounds of air is necessary in the four drive tires of the tractor, insuring good tractive effort after the load is dumped or when the tractor has been detached and is being used for other work.

● Tractor Plates

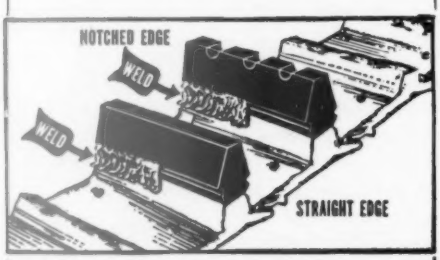
The track link (or rail) on track-laying tractors receives a great amount of wear due to abrasive materials falling into the working parts of the track. To maintain maximum traction efficiency, frequent replacement of these moving parts becomes necessary as they become worn. This costly repair makes it necessary to lay up the tractor for a long time, dismantle the entire assembly, replace pins, bushings, nuts and bolts with new castings and parts.

Through the development of special steels for welding by the Allied Steel Products, Inc., Cleveland, repair and replacement costs and "lay-up time" are reduced to a minimum. The link castings can now be salvaged by welding on to the rail surface, a special steel plate, which builds up the worn surface, restoring the original worn casting to its original weight and thickness. These plates are fabricated to correct sizes to fit the track-link casting and are affixed by gas or electric welding. They are made of a special work-hardening steel which becomes harder and tougher with use. Approximately 200 pounds of these special plates will save the purchase of a ton of castings. This is very important to tractor owners as it saves them considerable freight charges too. The plates are obtainable immediately from stock, while the new repair part casting is difficult to obtain because of shortage of metal and demands from the military. Many tractor owners and the U. S. Government are using this quick and economical method of repair on Caterpillar D-8 tractors. Plates are also available for other makes and models of tractors.



How tractor links are made to last longer.

Rebuild your
TRACTOR GROUSERS
WITH **BULLDOG**
Grip-Lugs



Easily Welded

Other Products
Trak-Link Re-Nu Plates
Mango Bars for Repointing
Digger Teeth
Excelloy Overlay Metal

Send for Folder PQ-4

ALLIED STEEL PRODUCTS, Inc.
N. B. C. Building
CLEVELAND 14, OHIO

IT COSTS NO MORE **TO USE THE BEST**

REPLACE WITH
"Indian Brand"

Shovel Dippers
Dipper Teeth
Shovel Treads

Crusher Jaw Plates
Mantles—Concaves
Bowl Liners
Roll Shells

Pulverizer Hammers
Grate Bars—Breaker Plates

Ball Mill Liners
Screen Plates

The Frog, Switch & Mfg. Co. CARLISLE, PA.
ESTABLISHED 1881

● Excavator

"A combination crane-excavator that will revolutionize small construction, excavating and materials-handling jobs" is the description now being applied to a new "secret weapon" for post-war-minded operators. Details on the new machine, developed by the General Excavator Company of Marion, Ohio, are being kept "under wraps" for the duration, according to Sales Manager Don B. Smith.

"Naturally we are proud," says Mr. Smith, "of the 'Machine of Tomorrow', which we have designated the General Type 10. It will render existing small-excavator designs obsolete and will allow owners to profitably handle a much broader range of miscellaneous jobs than was heretofore possible. It will go new places, do new things in a way that will warm the hearts of post-war planners.

"Actually, the Type 10 is the result of 5 years of intensive development work on self-propelled excavating and materials handling machines. As pioneer builders, before the war, of the highly successful one-man-operated, one-engine-controlled pneumatic-tired crane, our engineers already had a good start toward extending the versatility of this type rig to include excavating and construction work as well."

● Truck Scale

The Bonded Scale Company, Columbus, Ohio, has developed an easily transportable heavy-duty motor truck scale. With capacities from 15 to 30 tons, this scale is more easily moved between operations than so-called "portable" scales. The new equipment has massive construction for permanence, but with its extremely shallow, inexpensive pit and improved design, it can be moved from place to place, on short notice, as the occasion demands.

The shallow-pit scale can be set up, ready for use, in four hours or less minimizing time, labor, and expense involved in rapid pit construction. In addition, several new features of self-alignment have been incorporated, both in the weighing beam and understructure.

TRADE NOTES

The Thermoid Company announces the appointment of A. C. Teetsel as manager of friction-materials manufacturing. He brings exceptional qualifications to his new position as a result of active association with the automotive industry since 1920. He was executive vice president and a director of Ferodo & Asbestos, Inc., New Brunswick, New Jersey, from 1934 until recently. Previously, he did research, engineering and testing work with the Russell Manufacturing Company, Middletown, Connecticut, which involved close contact with car, truck and bus manufacturers.

The chief administrative offices of the Pomona Pump division of the Joshua Hendy Iron Works have been moved to Sunnyvale, California, for a consolidation with the general administration of the company. Affected by the change are the sales, engineering, purchasing and accounting departments.

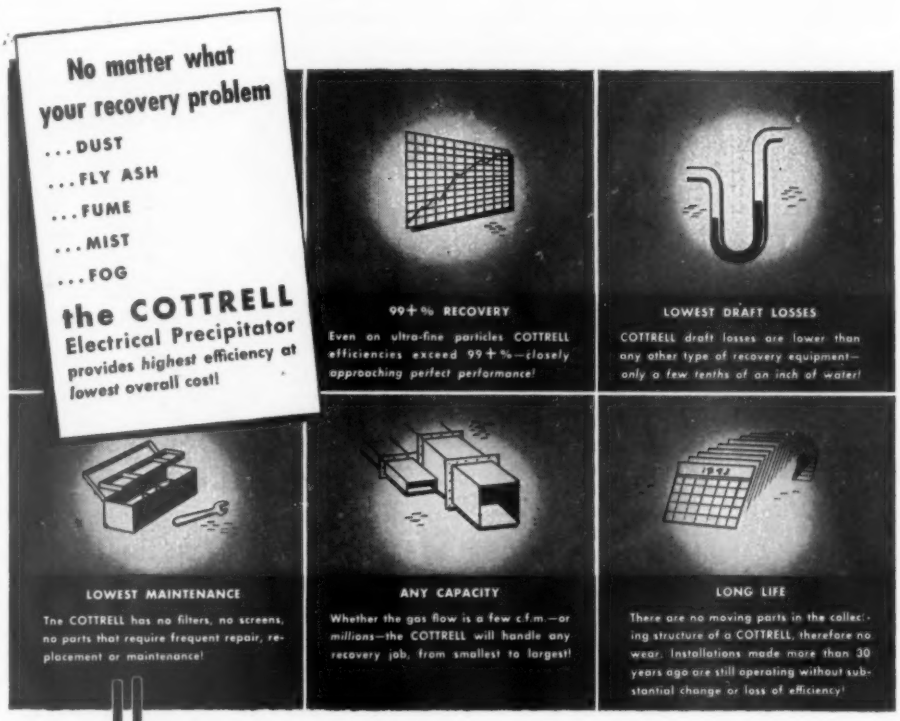
Among those moving their offices north are Arnold Brown, sales manager, A. W. Moore, advertising manager, and Ralph Linderman, export manager.

All manufacturing activities will continue to be carried on in the Southern California plants at Pomona and Torrance, with Charles L. Barrett as plant manager for both.

The Link-Belt Company, Pacific Division, announces the promotion of Fred A. Koepf and George T. Lundquist. Mr. Koepf, until recently assistant manager at Los Angeles, has been advanced to district manager for the northwest Pacific Division territory, with headquarters at Seattle. Mr. Lundquist, until recently assistant to H. V. Eastling, vice-president and sales manager, San Francisco, succeeds Mr. Koepf as assistant manager at Los Angeles.

Because the old name has outgrown its original importance the firm name of Willamette Hyster Company has been changed to Hyster Company.

With plants in Portland, Oregon, and Peoria, Illinois, and with branch offices throughout the United States and South America the Hyster Company manufactures tractor winches, hoists, and cranes and a complete line of industrial gasoline driven lift trucks. The firm is one of the pioneers in the materials handling field.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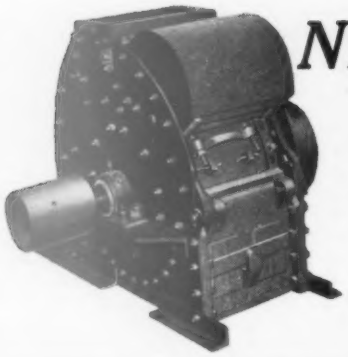

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Trade Literature

The pieces of literature listed below can be obtained direct from the manufacturers named, or requests can be addressed to Pit and Quarry's "Service to Readers" Department.

THE LINK-BELT "100" BELT CONVEYOR IDLER. (Book 1915), 16 pages. Link-Belt Company, Chicago.

DARASEAL. 7 pages. Dewey & Almy Chemical Company, Cambridge, Massachusetts.

EARTH MOVING AND CONSTRUCTION MACHINERY LUBRICATION. 50 pages. Cities Service Oil Company, New York.

BEE-TEE THICKENERS, AGITATORS AND CONDITIONERS. (Bulletin 403), 6 pages. The Galigher Company, Salt Lake City, Utah.

THE GEARY-JENNINGS SAMPLER. (Bulletin 411), 19 pages. The Galigher Company, Salt Lake City, Utah.

SCHRAMM AIR COMPRESSORS FOR ENGINEERING AND CONSTRUCTION. (Bulletin EC-44), 7 pages. Schramm Incorporated, West Chester, Pennsylvania.

THE THEORY OF SOLDERING, BRAZING AND LOW TEMPERATURE WELDING. 4 pages. Eutectic Welding Alloys Company, New York.

PATH-DIGGING BUCKET LOADERS. (Bulletin 744), 23 pages. George Haiss Manufacturing Company, New York.

MODEL 75 PORTABLE LOADERS. (Bulletin 844), 11 pages. George Haiss Manufacturing Company, New York.

HI-SPEED CABLE SCOOP. (Bulletin Z-2071), 5 pages. The Heil Company, Milwaukee, Wisconsin.

PROPELOFLO METER. (Bulletin 350), 3 pages. Builders-Providence, Incorporated, Providence, Rhode Island.

ELECTRIC HOISTS AND CRANES. (Bulletin 7373), 28 pages. Robbins and Myers, Incorporated, Springfield, Ohio.

OPEN STEEL GRATING AND STAIR TREADS. 23 pages. William F. Klemp Company, Chicago, Illinois.

REGULATORS FOR WELDING AND CUTTING. (Form 40), 15 pages. Victor Equipment Company, San Francisco.

FIRST ILLINOIS STATE ASPHALT CONFERENCE, 1944. 91 pages. The Asphalt Institute, New York.

INDUSTRIAL FRACTIONAL HORSEPOWER V-BELT DRIVES. 44 pages. The B. F. Goodrich Company, Akron, Ohio.

CENTRALIZED SYSTEMS OF LUBRICATION. (Bulletin 25), 15 pages. The Farval Corporation, Cleveland, Ohio.

WORM GEAR REDUCTION UNITS. (Catalog 300), 16 pages. The Cleveland Worm and Gear Company, Cleveland, Ohio.

QUARTERLY DIGEST OF CURRENT ASPHALT LITERATURE. 31 pages. The Asphalt Institute, New York.

SAFETY TROPHY DEDICATION. 32 pages. Huron Portland Cement Company, Detroit, Michigan.

NEW APPROACHES TO SURFACE PROTECTION. 12 pages. Preferred Utilities Manufacturing Corporation, New York.

MARKLEY-CARTER DUST COLLECTOR. (Bulletin 4402), 3 pages. Ralph B. Carter Company, Hackensack, New Jersey.

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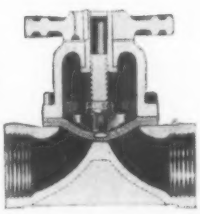

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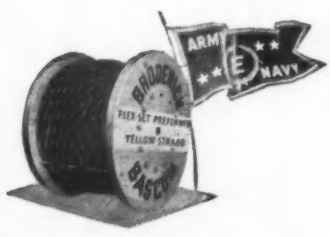

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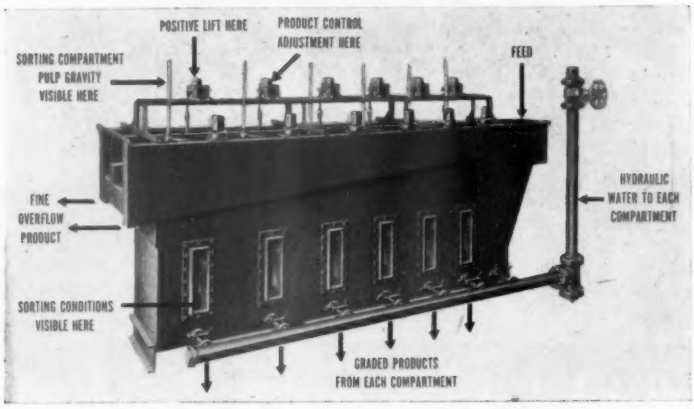

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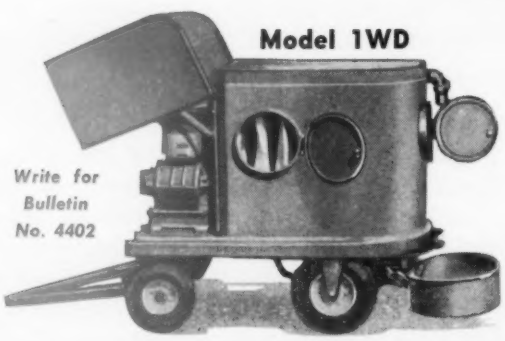

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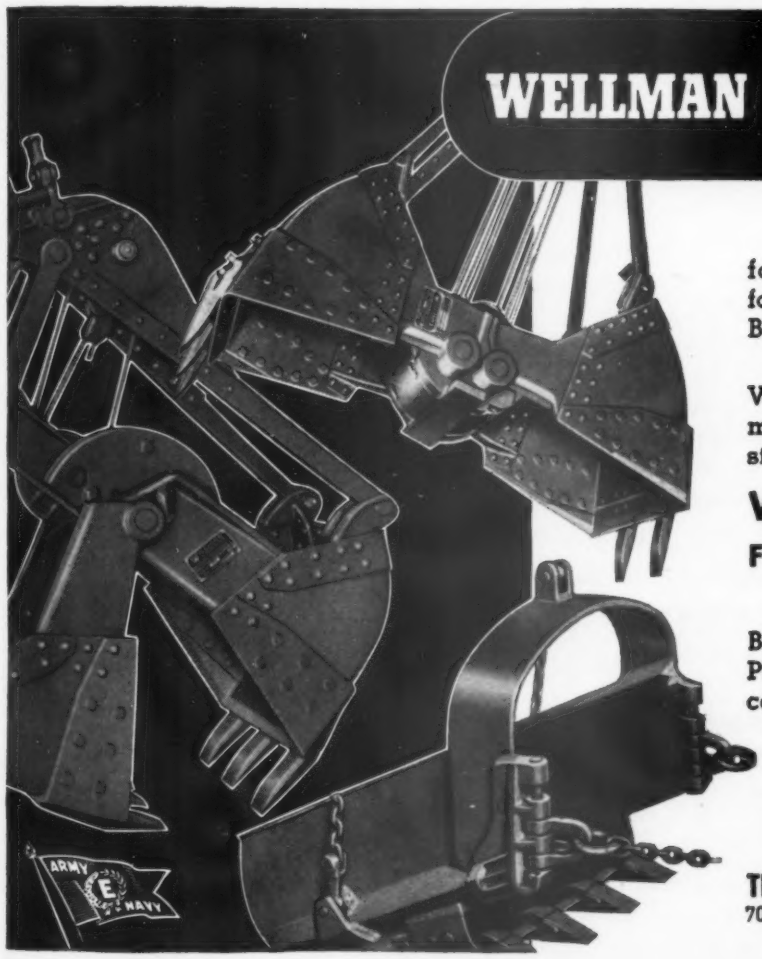

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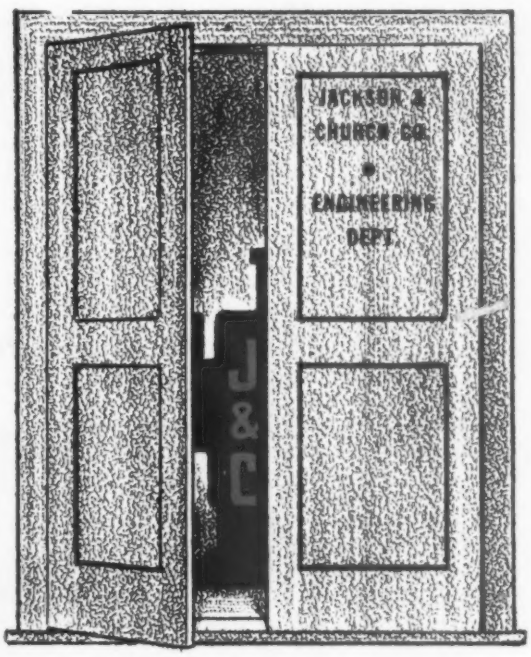

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SEPTEMBER, 1944

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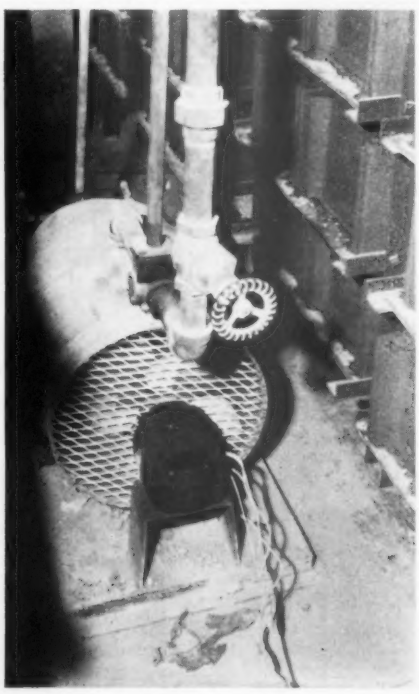
Gas Used to Provide Heat in Curing Kilns

Each of the eight curing kilns in the concrete-block plant of the Standard Building Products Company of Detroit is now force heated with gas. According to Ben Wilk, head of the concern and well known to concrete-products makers for his progressive efforts to improve manufacturing technique in the industry, the method has proved quite satisfactory since it was installed a few years back. The cost compares favorably with steam which was formerly used in the conventional manner and the system is extremely flexible, since each kiln is equipped with a unit heater and is operated independently of the others.

Temperatures ranging from 130 to 140 degrees F. are usually maintained, each gas burner being equipped with a 7-way control valve which regulates the amount of heat. A fan located immediately behind the burner blows the heat through the kiln and also disperses the moisture which is supplied by a water-spray nozzle located just ahead of the burner.



Gas burner, fan and sprays which heat and humidify curing kiln.

Each of the eight kilns has a capacity of 2,100 standard 8- by 8- by 16-inch units. These are manufactured on a Besser Vibrapac machine and two Besser tampers.

Slip Form Employed in Tank Construction

A new technique for the construction of cement storage tanks for grain has been announced by S. Carl Smithwick, district engineer of the Portland Cement Association in Spokane, Washington. The method involves the use of "slip-form" construction, in which ready-built forms, usually not more than five feet in height, are raised by jack screws as each section of concrete is poured.

A boom in the building of concrete elevators and storage tanks is predicted by Mr. Smithwick, who reports that independent grain growers and farm organizations are following a trend set by grain companies and turning to the sturdier type of construction.

Olympia Manufacturer Erects New Building

The Graystone Materials Company plant at Olympia, Washington, is now in operation, according to a recent announcement by company officials. The new concrete building-materials plant replaces the Olympia Concrete Products Company which was damaged by fire some time ago.

Graystone Names New Personnel Manager

James H. Silverthorn has recently taken over the duties of personnel manager for the Graystone Concrete Products Company, Seattle, Washington. During the past few years Mr. Silverthorn has been associated with irrigation districts and warehouse operation in the Tonasket vicinity.

Ironton Firm Acquires Plant in Kentucky

The Middle States Bituminous Corporation of Ironton, Ohio, has recently purchased the Wheeler & Putnam sand-and-gravel distributing plant and ready-mixed-concrete plant at Ashland, Kentucky.

Earley's Mosaic Concrete Opens Limitless Vistas in Products Field

General view of the Earley Studio in Rosslyn, Virginia.

By WILLIAM M. AVERY

another P and Q exclusive

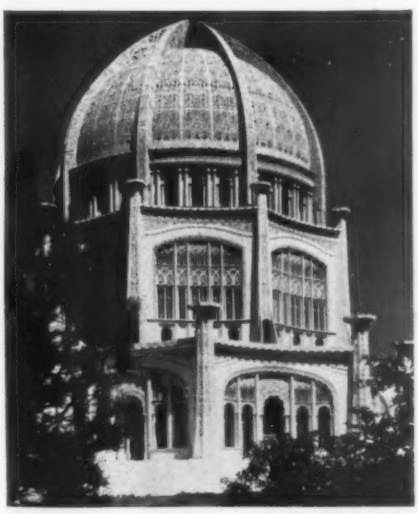
ESTABLISHED in 1889 by James Farrington Earley, the Earley Studio of Architectural Art and Craftsmanship occupies a unique position in the development of architectural concrete slabs. Any history covering the development of mosaic concrete would almost inevitably become a history of the Earley Studio, so intimately and inseparably are the two associated. James Earley's forebears had all been artists and craftsmen who devoted their lives to the making of models, carved stone, wrought iron, cast bronze, stained-glass windows and decorating ecclesiastical and secular buildings in the principal cities of Europe. With such a background it is not surprising that John J. Earley, who took over the studio upon the death of his father in 1906, should have been quick to recognize the architectural possibilities inherent in reinforced concrete.

The development of mosaic or architectural concrete began a quarter of a century ago when the United States Fine Arts Commission refused to approve the use of plain reinforced-concrete retaining walls at Meridian Hill Park in Washington, D. C. John J. Earley was retained to determine if a surface finish could be developed that would be acceptable to the commission. The late Case Gilbert, then chairman of the fine arts commission, suggested to Mr. Earley that an acceptable finish might be produced in the style of the pebble mosaics of Italy.

Acting upon this suggestion, Mr. Earley produced the series of retaining walls which are still in place on Washington's Sixteenth Street. Not satisfied to let the matter rest there, Mr. Earley immediately began experimenting with the use of carefully graded pebbles to produce better surface uniformity, and later with the use of crushed and graded pebbles. When exposed by brushing and washing with a weak acid solution, these aggregates gave the surface a striking effect, and the new material soon made its appearance in such projects as the duplicate of the Parthenon at Nashville, Tennessee, the Louisiana State University at Baton Rouge, and Lorado Taft's famous Fountain of Time in Chicago.

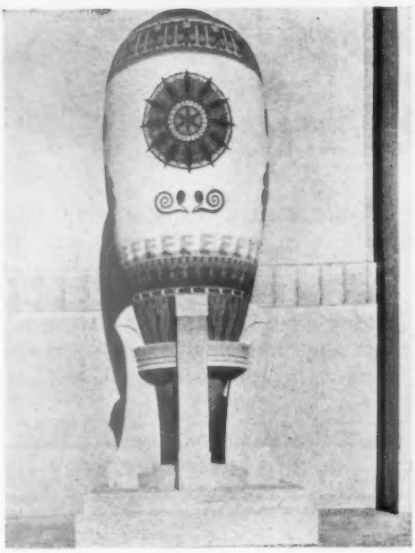
Color variety was relatively unimportant in these projects and the surface consisted of exposed aggregates of yellowish quartz. But Mr. Earley was already experimenting with the rendering of colored mosaic designs in the surface of his casts and by 1928 he had created the complete interior finish of the Shrine of the Sacred Heart in Washington, employing a wall surface of quartz and other colored stones, and using Ravenna ceramics and glasses for colors not obtainable in natural stone. When the late General George W. Goethals, of Panama Canal fame, visited the church after its completion, Mr. Earley asked him what phase of the undertaking he found most impressive. "The nerve of the man who let you do it," the general replied.

In 1932 the Earley Studio was commissioned to supply the dome ornamentation for the Baha'i Temple at Wilmette, Illinois. Mr. Earley and his associate, Basil G. Taylor, began this ambitious project by constructing in the studio yard a full-sized wooden model of the steel work for one of the nine equal segments of the dome. The ornamentation is unique in that about a third of its total area is perforated, and it

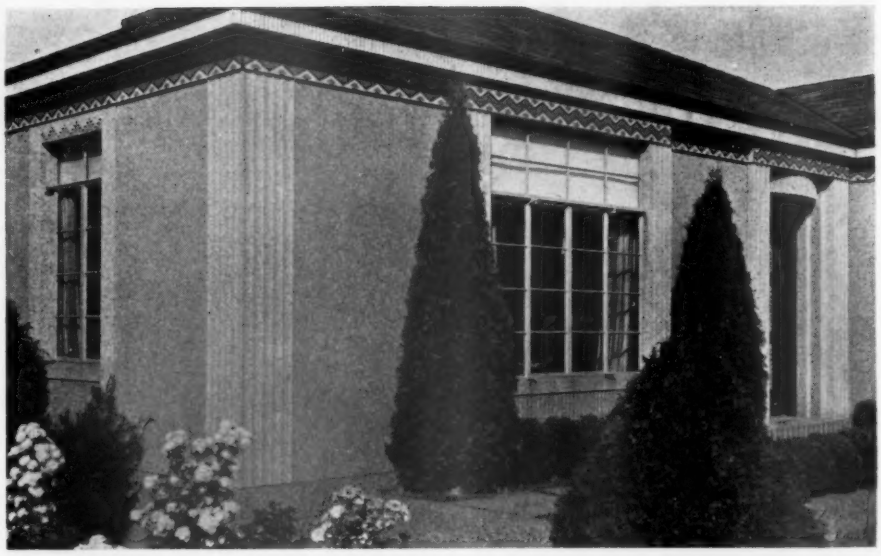


The Baha'i Temple in Wilmette, Illinois.

John J. Earley, creator of the Earley process.

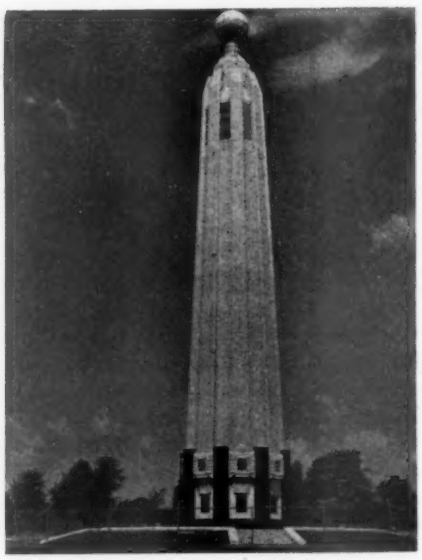


Mosaic concrete urn cast in the Earley Studio.



Residence in Silver Springs, Maryland, showing varied effects obtainable with precast slabs.

Close-up of some of the intricate filigree panels in the Baha'i Temple.



Architectural concrete in the Edison Memorial Tower at Menlo Park, New Jersey.

International boundary posts cast in the studio.

Earley slabs were used for the Squibb Laboratories at New Brunswick, New Jersey.

was quickly recognized that if cast as a continuous fabric over steel supporting members, the internal stresses set up in drying would inevitably tear the shell to pieces. It was decided, therefore, to precast the dome in sections at the Rosslyn, Virginia, plant, and to ship them by railroad to Wilmette for erection.

The largest of the 387 6-inch reinforced-concrete slabs measures

Vibrating screen used for grading exposed aggregates.

10 by 12 feet and weighs 3½ tons. The exposed aggregate consists of pure white quartz, and the shimmering, lacy surface presented has made the Baha'i Temple one of the most striking landmarks in the Western Hemisphere. The castings are bolted to the steel framework, using fittings cast in the concrete. Between the sections there is an open joint one-half inch wide to allow for deflection and temperature changes.

In 1934 Mr. Earley was awarded a second contract for the ornamentation of the clerestory — the 19-foot drum below the dome—and in 1937 castings of the window grilles and other sections was begun. Late in 1942 the 918 sections of the steps were cast and placed to complete the exterior ornamentation.

The successful use of precast slabs in the dome of the Baha'i Temple aroused world-wide interest among architects and engineers, and gave considerable impetus to the further development of the Earley process. Its next major application was in the new Department of Justice building in Washington. Here the new technique made it possible to precast the bright-colored mosaic ceilings in 2-inch slabs of reinforced concrete, which were hung from the building girders and used as forms against which the ceilings were poured.

The mosaics in the Department of Justice building are the first ever made of American materials. After years of experimenting the studio has developed a process of making ceramic and vitreous enamels of vivid and perfect colors.

At the Rosslyn plant complete facilities are available for the grinding and sizing of aggregates. Quartz stone carefully selected for its color, density and durability, is crushed in a Sturtevant 8- by 10-inch jaw crusher. A Tyler rotating screen and a Tyler Hum-mer 2-deck vibrating screen are used for sizing. The prepared aggregates, ranging from ¼ inch maximum dimension to finely ground sand, are stored in bins either in bags or in bulk, depending on the amounts being handled.

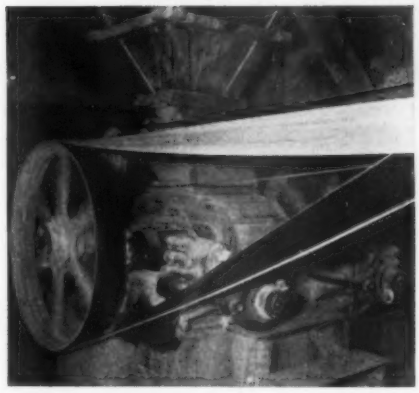
The mosaic-concrete facing is mixed in the approximate proportions of 94 pounds of Atlas white cement, 110 pounds of fine aggregate, 300 pounds of coarse aggregate and 5 gallons of water. Both the coarse and the fine aggregates are carefully blended to produce the required color. The studio has always used Atlas white cement from the Northampton plant to assure a uniformly white matrix that will bring out the full color of the exposed aggregates.

The slabs are made face downward, and the mosaic decoration is accomplished by placing ridges about an eighth of an inch high on the plaster forms of the mold to

"Running a model" for a precast sill. English burlap is dipped in plaster.

mark the lines between the various colors of the design. The colored mixtures are then placed in their proper positions in the mold to a depth of about three-quarters of an inch, the wire-mesh reinforcing is placed, and the mold is filled to the required depth with ordinary sand-and-gravel concrete of the same proportions as the facing.

The excess water in the mix is removed by absorption and vibration



Jaw crusher used in the preparation of exposed aggregates.

after the materials are in place. It has been found that additional water may be removed from apparently dry concrete by a second application of absorptive materials accompanied by vibration without disturbing the granular arrangement of the aggregates.

After standing for 12 hours the cast is removed from the mold and the exposed face is scrubbed with wire brushes to remove surface cement and expose the aggregates. The full brilliance of the colors is brought out by bathing the surface with a weak solution of muriatic acid. The casts are cured in a humidity-controlled chamber for 14 days, from which they emerge with a flint-like surface and crushing strengths as high as 5,000 pounds per square inch.

Among Mr. Earley's many interests has been the use of precast mosaic slabs for houses. Partly as a demonstration and partly to gain experience a small five-room house has been built in the suburbs of Washington. Only the walls and foundations of this house are made with concrete, the framework consisting of traditional timber construction. The side wall consists of 32 panels, each 7 feet high and 2 inches thick and ranging in width from 4 to 8 feet. The exposed aggregate on the surface of the panels consists of red jasperite quarried in Oklahoma, and in appearance they closely resemble pink granite. The window trims and corner pilasters are made of buff-colored quartz, and a polychrome cornice surrounds the entire building. Other ornamentations are chiefly of a deep cobalt blue.

Mr. Earley feels that this principle of construction—the free attachment of prefabricated thin slabs to a skeleton framework—is an important step forward in the development of concrete as an architectural medium. He points out that houses made with mosaic concrete panels may, due

Casting a large architectural slab. The decorated face is down.

to the plastic nature of the material, incorporate individuality of design without sacrificing the economies of mass prefabrication. Wide variations are possible from a single set of molds by using different aggregates to change colors, by varying the ornamentation and by recomposing the parts of the house.

Since the outbreak of the war the studio's principal activity has of necessity been turned away from purely architectural concrete. To assist in the war effort and to keep the organization intact as much as possible, contracts have been accepted for catch-basin frames and covers, large inlet frames for airports, boundary markers and a host of other items alien to the studio's normal output. The same painstaking craftsmanship that created the Baha'i Temple has gone into the

Revolving screen used for grading exposed aggregates.

execution of these war-time projects, and there is every assurance that the organization's skill and its remarkable flare for blazing new trails will come through the war intact.

Although Mr. Earley and Mr. Taylor hold patents on the Earley process, they have for years urged and encouraged others to study and acquire the techniques they have developed. With true artistic prodigality they would like to see the studio become a center for the training and inspiration of other craftsmen with the vision and the tenacity and the courage to carry on in a field whose potentialities seem unlimited.

OPA Allows Increase in Cement Prices

An increase of 10 cents a barrel in manufacturers' and resellers' present ceiling prices for cement produced in the states of Ohio, Michigan, West Virginia, the western portion of Pennsylvania, the western tip of Virginia, and a portion of eastern Kentucky was announced August 26 by the Office of Price Administration.

The increase (effective August 30, 1944) applies to all types of Portland cement, except white cement, and includes masonry cement and other special types.

The same order also increases the prices of special cements, except white cement, in the northeastern states, comprising: Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, eastern Pennsylvania, Maryland, Delaware, District of Columbia, the city of Alexandria, Va., and five counties in northern Virginia. The increase amounts to 20 cents a barrel.

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CONSTRUCTION MACHINERY

Block Plant Employs Unique Mono-Rail System for Handling Racks

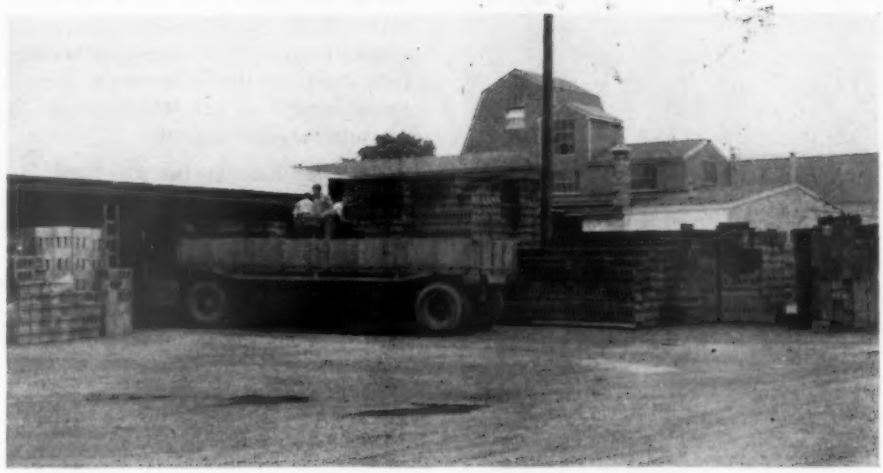
another ON THE SPOT report

TYPICAL of the excellent war-time jobs being done by concrete-products plants throughout the nation, the Standard Concrete Products Company of York, Pennsylvania, for the past two years has sold 95 per cent. of its output to war industries and housing projects along the eastern seaboard. The plant, which is outstanding in respect both to equipment and to methods employed, includes a limestone quarry with crushing and screening capacity for 100,000 tons of crushed limestone annually.

The company is now operating two block machines: a Stearns number 7 Joltcrete installed in 1940 and a Besser Vibrapac installed in May of this year to assist in meeting the continued high demand for concrete and cinder blocks in the area.

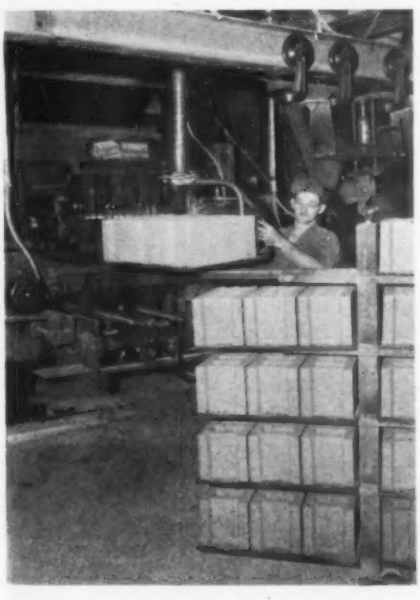
Using only its own crushed limestone for concrete blocks, this firm has taken full advantage of the opportunity thus afforded to maintain careful gradation of aggregates at all times, and as a result its stone blocks regularly test in excess of 2,000 pounds at 28 days. The aggregates are elevated to 3 overhead bins of 80 tons capacity each, from which they flow by gravity to volume batching boxes designed and built at the plant.

The batching boxes move on an overhead tramrail to the two Stearns mixers of 28-cubic-foot and 13-cubic-foot capacities. The cement is added by hand from bags. From the larger of the two mixers a Stearns skip hoist feeds the recently installed Besser Vibrapac. The 13-cubic-foot mixer supplies the Stearns No. 7 Joltcrete over a short belt-conveyor.



General view of the Standard Concrete Products Company plant. Storage shed is at the left.

By WILLIAM M. AVERY



One of the block machines. Note rack suspended from monorail.

A Besser pneumatic off-bearer transfers the blocks from the machine to metal racks which have capacity for 30 8-by-8-by-16-inch units. The racks are moved by hand on an overhead Peerless monorail system running from the block machines to the 7 curing rooms and to the storage shed. Small wheels on the bottoms of the racks permit maneuvering them on the floor when necessary. The loaded racks are picked up from the floor by a small hand-operated hydraulic jack which is built into the monorail trolley. The handling of both loaded and empty racks by this system appears to be accomplished with ease and dispatch.

The 7 curing rooms have a total capacity of 8,000 blocks. Water sprays are used and the time cycle varies from 24 to 48 hours. An unusual feature of the plant is the large under-room area provided for final curing and storage. Up to 200,000 8 by 8 by 16-inch equivalents can be accommodated in the curing shed, in which the blocks remain for from 21 to 28 days before they are moved out-of-doors or shipped.

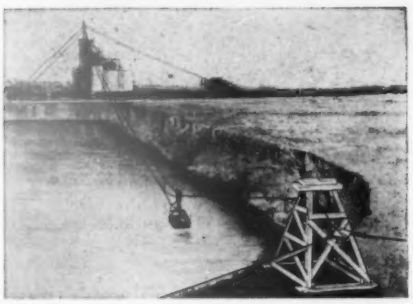
About half the company's block production at present consists of cinder blocks, the cinders for which are brought into the plant by railroad. After crushing a New Holland role-crusher the cinders are elevated to a single-compartment storage bin at which they pass over a vibrating screen. The oversize material drops through a chute and is re-crushed. Depending upon demand, the cinder blocks are made on either the Stearns or the Besser machine. The company's cinder blocks test in excess of 1,000 pounds compressive strength at 28 days—another indication that careful preparation of aggregates has a direct bearing on the quality and strength of blocks.

The 28-cubic-foot mixer and skip hoist.

In the same building the company produces about 1,500 tons annually

More Yardage with Less Labor

Here is a small Sauerman Scraper (¼ cu. yd. size) moving sand from stockpile to concrete products factory. One man running machine two hours per day supplies plant with sand, a job that formerly kept three men hauling sand 10 hours a day.



This Sauerman Slackline Cableway digs down to the bottom of a deep gravel deposit and hauls the material to top of plant at cost of few cents per cubic yard.

GREAT savings in man-hours are being made by using Sauerman Power Scrapers and Slackline Cableways in sand and gravel excavation, stockpiling and other material-handling jobs where the long operation range of these machines can be employed to advantage.

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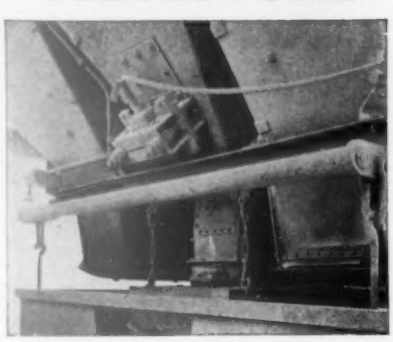

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3600 powerful "Electronic-Controlled" vibrations per minute break down arching and plugging—assure a steady, free flow of materials.

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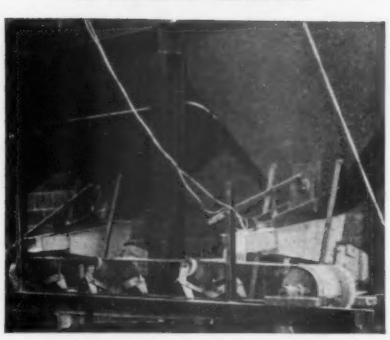

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The roll crusher used for preparing cinders.

of cast-stone work ranging from lintels, shelves and flagstones to ornamental stone panels, park benches and urns. Except for standard lintels, these items are all made on special order and no attempt is made to accumulate stocks. The firm's general manager, Navin D. McWilliams, is confident that this phase of the business will grow rapidly after the war. Despite the war-time curtailment of ornamental work in building construction the company has kept four men employed full time on cast-stone work for several years.

The Standard Congrete Products Company owns and operates a fleet of 11 trucks for making deliveries. The largest, a Diamond T tractor

Vibrating a cast stone coping with Ingersoll-Rand air hammer.

and Freuhauf trailer, has been purchased within the past year to facilitate deliveries to war plants. The production of blocks is currently only about 5,000 per eight-hour day due to the shortage of man-power, although the plant's capacity is considerably greater. Nine men are now employed on block production.

In addition to supplying stone for the block plant, the company's quarry and crushing plant furnishes about 1,500 tons per month of crushed stone to the York Concrete Company for ready-mix operations.

Concrete-Pipe Plant Devotes All Its Facilities to Cribbing Manufacture

another ON THE SPOT report

ONE of the pioneers in the development of various types of reinforced concrete pipe and cribbing, the Universal Concrete Pipe Company established its first plant at New Martinsville, West Virginia, in 1921. To-day the company owns and operates 33 plants, located at strategic points in the central, southern, and eastern sections of the United States, and other plants using the Universal system of production are located on the Pacific coast, and in Cuba, Panama and South Africa. This remarkable expansion in a comparatively short span of years is largely due to an alert, progressive management which has sought untiringly to develop better methods and new products in its field.

Some 15 years ago the first concrete cribbing was manufactured at the New Martinsville plant, and in the past 7 years this phase of the company's activities has expanded rapidly. The plant is now wholly devoted to the manufacture of cribbing, in an earnest endeavor to meet the demands of city, county and state highway departments, and industrial plants in the vicinity. This article will confine itself to a description of the operations at New Martinsville.

Trucks haul crushed gravel to an underground concrete hopper from bins at the Ohio River Sand & Gravel Company, located adjacent to Universal's plant — a haul of about 100 yards. Size minus-½-inch is used, with the soft stone eliminated. A bucket-elevator conveys the material to an overhead all-steel Heltzel storage bin divided into 2 compartments, each having a capacity of 35 tons. The aggregates flow by gravity into Heltzel automatic volume measuring boxes, from which they drop on an 18-inch Goodrich conveyor belt. The conveyor discharges directly into a Stearns 30-cubic-foot mixer, where cement is hand-fed from bags. The customary proportions of the mix are 1 to 1½ to 2½, using a water-cement ratio of about 1 to 6 to obtain a slump of from 3 to 4 inches. Only the lighter shades of cement are used.

Some of the cribbing units in place.

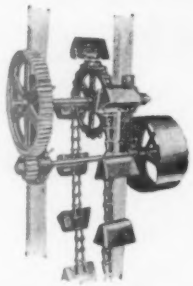
The mix flows by gravity through a steel hopper to a Universal agitator feed-box which keeps the concrete active and prevents separation of the aggregates. From the feed-box it flows in an open metal trough to steel forms resting on a special mechanical vibrating table designed by the company's engineers. A 20-horsepower variable-speed motor makes it possible to adjust the number of strokes per minute of the vibrating table to suit various mixes and other factors. The all-steel forms are fabricated in Universal's shops at Columbus, Ohio. The company has experimented with, and still uses, battery-forms with capacities for as

A view of the plant at New Martinsville.

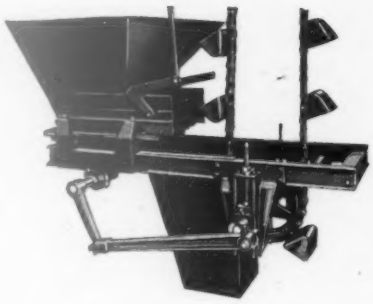
Erecting a retaining wall with concrete cribbing.

Agitator feed-box discharging concrete to battery of cribbing forms.

AGGREGATE ELEVATORS



Kent Top Drive



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Makes a test for moisture content of sand or stone in ONE minute. Accurate to ¼%.

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Delivers correct DRY weight of aggregates and ADDED water. Makes a graph record of EVERY BATCH.

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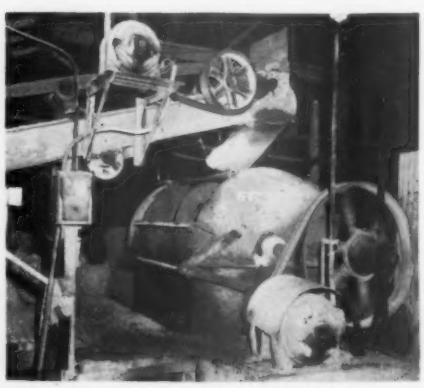
Bin gates and measuring boxes for aggregate.

many as 8 six-inch cribbing units, but it has found that single or duo-forms are considerably more economical due to the ease with which they can be handled.

The forms are transferred on Barrett-Cravens jack-lift trucks to the curing bins where both the interior and the surface of the concrete are thoroughly vibrated before troweling. The units are steam-and-water-spray-cured for 4 hours, and then removed to an 80- by 170-foot storage building where the forms are stripped by power. Water-spray curing is continued for a period of 7 days in the storage building.

The cribbing units are stacked on mine cars in the same manner as cross ties, and remain in the storage building until they are shipped in order to prevent discoloration. The building has a capacity of 25,000 units, and the loaded cars are handled by a 2½-ton overhead crane. Cribbing is shipped from the plant by truck for distances up to 125 miles and by railroad to more remote points. The company operates its own 24-foot 10-ton Fruehauf trailer and additional trucks are hired when they are needed.

Although the New Martinsville plant has facilities for making up to 50 tons of cribbing per 8-hour day, the present shortage of manpower has cut production to about 25 tons. The present force of 22 men is working 48 hours per week.



The 30-cubic foot mixer.

The rapid acceptance of concrete cribbing as a valuable construction material is in a large measure due to the excellent engineering service provided by Universal on all installations, both before the placing of orders and during construction. In many instances the company's engineers provide complete design drawings for particular walls, and all major jobs are watched closely after installation to gain knowledge and experience for future designs.

Twelve principal standard cribbing units are made for walls from 4 feet high (without surcharge), to surcharged walls 20 feet and more in

Vibrating the concrete in steel cribbing forms.

height. The major part of Universal's production goes into retaining walls for highways, railroads, flood-control walls and bridge abutments. The use of concrete cribbing for bridge abutments is growing rapidly due to the ease of installation and the elimination of piling or special footings. A closed-face type of cribbing is made for use in residential sections and for flood-control walls and small dams. All cribbing units contain steel reinforcing.

When manpower is available after the war the New Martinsville plant will very probably produce concrete blocks. A Stearns clipper block machine is set up but not operating at present. All the company's production of concrete pipe in this area is now concentrated at the Clarksburg, West Virginia, plant. A new cribbing plant at Bridgeville, Pennsylvania, started operating several months ago.

The Universal Concrete Pipe Company's main offices are located in Columbus, Ohio. H. Eschenbrenner is president of the company, and Sam Buderman is production and service engineer. Oliver P. Morgan is superintendent of the plant at New Martinsville.

Spencer Park Project an All-Concrete Job

Before Pearl Harbor, Hastings, Nebraska, had a population of approximately 15,000. The town's 1944 population is not a matter of record but due to the building of a large naval-ordnance depot it has increased by thousands, resulting in a critical shortage of decent housing accommodations.

Both the government and private builders are currently very busy doing their share to relieve the housing shortage for Hastings and provide livable homes for ordnance-plant workers on a reasonable economic basis. Three individual builders have completed 98 houses under F.H.A. Title VI insured mortgage provisions. Seventy-three of these are concrete masonry residences of attractive design which will be a community asset for many years after the housing shortage has passed.

The government's part in providing homes for war workers in Hastings is a 682-family F.P.H.A. project known as "Spencer Park," comprising 150 one-story buildings all with concrete-masonry walls and 5-inch concrete floors placed on a fill. The unique feature of the Spencer Park project is that although the houses are officially designated as "temporary dwelling units," concrete was selected because of the opportunity for speedy construction, saving of critical materials and over-all economy. Besides there was the additional advantage of safety from fire.

All door and window sills are precast concrete as are the chimney caps and splash blocks under the eave spouts. Each dwelling unit has a shower bath installed with a concrete shower curb.

Besides the use of concrete for constructing the buildings, 15,000 square yards of concrete paving 5 inches thick was placed in lanes 10 feet wide. There are 20,000 linear feet of combined concrete curbs and gutters and 30,000 square feet of 4-inch thick sidewalk.

Exterior house walls are finished with two coats of Portland-cement paint. Interior walls are furred out for attaching wall board and 1-inch blanket insulation.

The Spencer Park houses were built by Ralph E. Rippe, contractor, of South Pasadena, California, for the Federal Public Housing Authority. Davis & Wilson, architects, of Lincoln, Nebraska, designed the buildings with Robert Fulton, also of Lincoln, as engineer. The concrete-masonry units were supplied by the Platte Valley Cement-Tile Company, of Kearney, Nebraska, and the Concrete Products & Materials Company, of Hastings.

The three operative builders whose private enterprise also has contributed to relief of the housing shortage in Hastings are Carl C. Wilson, of Omaha, Ervin E. Peterson, of Bellevue, and Eldon C. Westcott, of Hastings, head of Hastings Builders, Inc.

Mr. Wilson, with previous experience in concrete-masonry war-housing construction in Omaha, Kearney and McCook, Nebraska, has built two- and four-family concrete masonry houses in Hastings to accommodate 28 families. The exterior walls in these houses are finished with a variety of stucco finishes. Interior walls are furred and plastered.

Mr. Westcott's organization has built 36 single-family concrete-masonry houses and 13 others with concrete-masonry walls faced with brick.

Ready-Mixed Makers May Increase Prices

Manufacturers of ready-mixed concrete located in Michigan, Ohio, West Virginia, western Pennsylvania, a portion of eastern Kentucky, and the western tip of Virginia, may add to their established ceiling prices the actual amount of increase resulting to them from the 10-cent-per-barrel increase granted to manufacturers of cement in that area, the Office of Price Administration announced August 26.

Effective August 30, 1944, this action provides that resellers of ready-mixed concrete may pass on increases resulting to them from the adjusted manufacturers' ceilings.

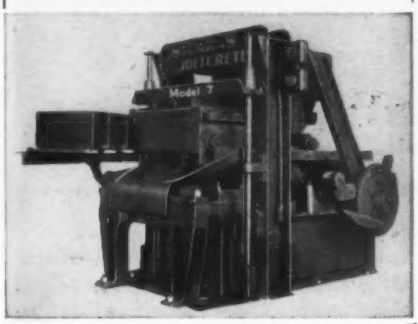
Data received from producers of ready-mixed concrete in the area covered by the increase indicate that they are unable to absorb the increased cost of Portland cement—the principal component of their products.

Previous to the increase, producers' prices were "frozen" at the highest price charged each class of customer in March, 1942.

Producers of other cement products, such as concrete block and pipe may not increase their prices. Any action found necessary in the future for such producers will be taken under the appropriate regulation.

(Amendment No. 47 to Order A-1 Under Section 1499.159b of Maximum Price Regulation No. 188—Manufacturers' Maximum Prices for Specified Building Materials and Consumers' Goods Other Than Apparel—effective August 30, 1944).

The Vibration Machine Supreme



Vibration under pressure — 7,200 blows per minute—and ruggedly built to give long life, the Joltcrete machine is the choice of the wise concrete-products operator. Produces clean-cut, high strength units in any size, and gets the most out of a bag of cement. Built in three sizes with capacities of 7 to 9 standard units per minute.

Hobbs block machines, Anchor tampers, Anchor Jr. strippers, Stearns power strippers and Joltcrete, Stearns mixers and Cast Iron and Press Steel pallets, Straublox oscillating attachments, etc. Repair parts for: Anchor, Ideal, Universal, Stearns, Blystone mixers and many others.

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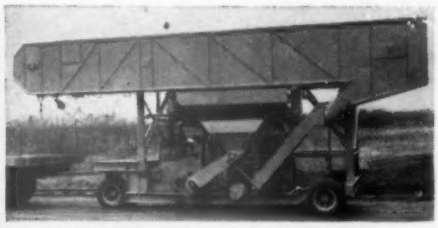

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The crusher and screen in front of the plant.

Small-Town Block Manufacturer Gains Reputation for Quality

THE woods are still quite full of small concrete-block plants which depend entirely on local demand for their output. Most such plants are "hay-wire" operations using old and inefficient equipment but there are some exceptions. One of the exceptions is a plant operated at Durham, North Carolina, by George D. Owen as the Carolina Cinder Block Company. Mr. Owen had worked for 13 years for the Hudson Supply and Equipment Company, Washington, D. C., when he decided to go into business for himself. He bought a small machine from that company and built a small plant at Brookneal, Virginia, a town of about 750 population located 30 miles south of Lynchburg and 120 miles north of Durham.

Skip which feeds cinders to the mixer.

After operating this plant for two years he saw an opportunity for a larger plant at Durham. This plant went into operation in March, 1942, and has been busy ever since, in spite of stiff competition from local clay brick and tile plants. Several sizable war contracts kept things humming, including an order for 16,000 blocks for an Army hospital at Camp Buckner near Durham. At the same time Mr. Owen developed a growing market in rural sections near Durham through personal calls and newspaper advertising in Durham and near-by small towns. With Army camp construction he is now selling most of his blocks for the construction of small industrial buildings, dairy barns, war workers' homes, etc. After building restrictions are lifted he expects to get such work as basements for private residences, backup and exterior walls for churches, dry kilns for lumber mills, etc. Much of the output is used for exposed work which is often stuccoed or painted.

A surprising amount of his business, according to Mr. Owen, comes from southern Virginia as a result of the reputation built up by his product when he was located at Brookneal.

The cinders are received from various local sources and are of good quality. They are first passed over a home-made vibrating screen and the oversize is reduced by a New Holland B24 hammer-mill. A small screen under the hammer-mill sizes its product.

The cinders are wheeled in barrows to the skip feeding the 14-cubic foot Besser mixer. Cement is added from sacks. The concrete is discharged from the mixer into the Besser Master Vibrapac plain-pallet block machine. This has most of the usual automatic features but the wooden pallets are fed to it manually. It is equipped to make 6-, 8-, and 12 by 8 by 16-inch blocks.

Vibration block machine making standard cinder units.

The curing is done in 3 rooms with a combined capacity of 2,500 blocks. The heat for curing is supplied by coal-burning salamanders and pails of water on top of these supply ample humidity. After 36 hours inside the blocks are moved to outdoor storage. The finished blocks test over 700 pounds and the standard 8-inch unit weights 30 pounds.

Henry N. Battjes, 53, Dies at Grand Rapids

Henry N. Battjes, 53, president of the Grand Rapids Gravel Company, and the Lamar Pipe & Tile Company, Grand Rapids, Michigan, died August 6. Death was attributed to a kidney complication.

Mr. Battjes had lived in Grand Rapids all his life. He was associated with his father, the late Nicholas Henry Battjes, founder of the gravel firm, and had been president of that company ten years. He was a director of the National Sand & Gravel and National Ready-Mixed Concrete Associations.

Haul More in '44

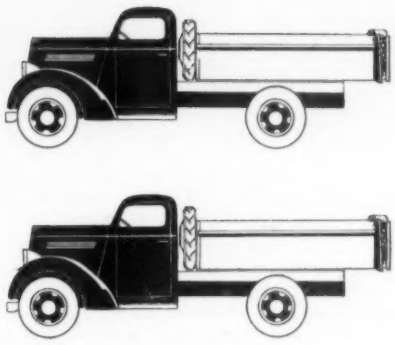
THE THORNTON WAY

MAKE YOUR 1½-2 Ton MEDIUM TRUCK DO WORK OF TWO!

Flash! WPB Has Now Removed All Restrictions from Third Axle Conversions

THIS

1 Heavy Duty Truck
1 Driver (does work of two)
1 Wage



NOT THIS

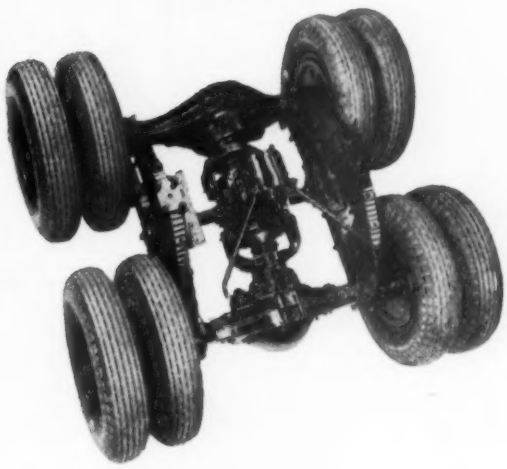
2 Medium Trucks
2 Drivers
2 Wages

THORNTON GIVES 100% MORE TRACTIVE EFFORT...100% MORE PAYLOAD CAPACITY

Whether your business is mining, logging, lumbering, oil production, hauling, construction work, etc., you face the need of more heavy duty trucks. *Where* can you get them? *Here is the solution:* If you own a new or used 1½-2 ton medium, we can convert it into a rugged, powerful, 6-wheel heavy duty truck capable of hauling 100% *more* payload through dirt, sand, mud, snow and up steeper grades.

We can prove savings in manpower . . . investment . . . operation . . . upkeep.

You need this heavy duty conversion. Place your order with Thornton today. Make more money with one truck.



This is the Thornton Drive, consisting of two driving axles, two-speed gear case assembly, "walking beam" type springs; wheels; tires.

THORNTON TANDEM CO.
8741-D GRINNELL AVENUE • Plaza 9700
DETROIT 13, MICHIGAN, U.S.A.

Investigate **THORNTON** *Automatic-Locking* **DIFFERENTIAL** for Replacement in Truck Axles

In Canada see: **H. V. WELLES, LTD.**, Windsor

Thornton Tandem Co.
8741-D Grinnell Avenue
Detroit 13, Michigan, U.S.A.

Please send me catalog of facts on changing my 1½-2 ton truck into a heavy duty truck.

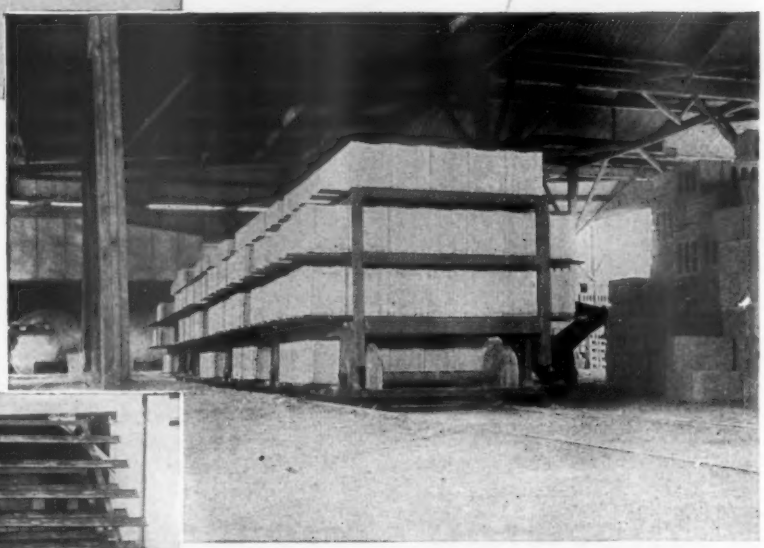
Name_____
Address_____
City_____ State_____
Make of Truck_____ Year_____
Used for_____

The CONCRETE MANUFACTURER

CHASE

. . . for 35 years the leading maker of lift-truck racks and cars for the concrete products industry

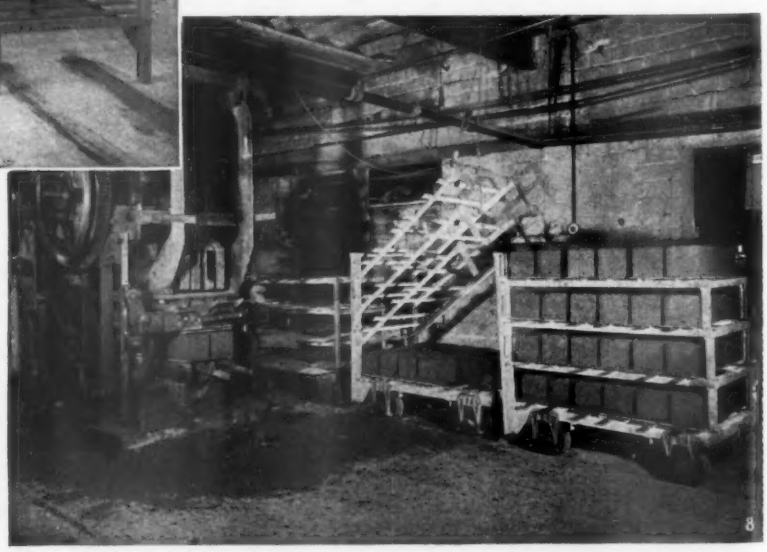
ABOVE — Chase Style 2167 Lift-Truck Racks with steel decks in the block plant of the Currier Lumber Co., Detroit, Michigan.



RIGHT—Chase Style 198 Block Cars for high-pressure steam curing at L. G. Randolph Concrete Products Company plant, Ann Arbor, Michigan.

LEFT—Chase Style 294 Hinged-deck Lift-Truck Racks in the block plant of the Cleveland Builders Supply Company, Cleveland, Ohio.

BELOW—Chase Style 293 Hinged-deck Block Cars in service at Edmonds Art Stone Company, Washington, D. C.



Any Style or Design Lift-Truck Rack or Car for Your Plant

•

WRITE FOR CATALOG

THE CHASE FOUNDRY & MANUFACTURING CO.
Columbus 7, Ohio

Make 6" to 48" CONCRETE PIPE with ONE Machine

Universal's "all-purpose" machine will give you this range of sizes! It's the versatile machine we perfected for use in our 26 pipe-making plants. We can also equip you to make larger pipe—up to the 135" diameter we make to meet highway needs. Because we are pipe manufacturers ourselves, our advice as well as equipment is worth getting. With BOTH, you'll be set to produce pipe profitably.

Write for catalog and details

UNIVERSAL CONCRETE PIPE CO.

Home Office, 297 S. High St., Columbus 15, Ohio

26 Plants in Eastern, Central, and Southern Locations

Eastern Sales Division, 1824 Graybar Bldg., N. Y. C.

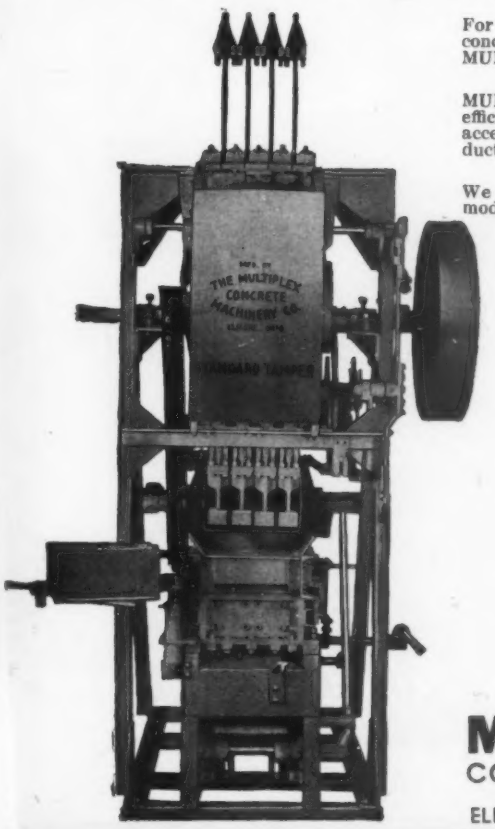
JAEGER "FLEET FOOT" CRANE-LOADER

Can travel 12 m.p.h., turn in 10½ ft., climb any ramp—hoists faster than 1 ft. per second and swings 12-18 ft. boom 90° to either side without outriggers for loading and accurately placing up to 10,000 lbs. Nimble, powerful, safe (no load ever over operator). Tier loader attachment if desired. Send for Specification CL-44.

THE JAEGER MACHINE CO. 602 DUBLIN AVENUE COLUMBUS 16, OHIO

Hoists, Winches, Air Compressors, Truck Mixers, Mixers, Centrifugal Pumps

MULTIPLEX Machines For Postwar Profits



For a Quick "Take-Off" and sustained pace in concrete block output, reserve one of the MULTIPLEX *high-speed* machines.

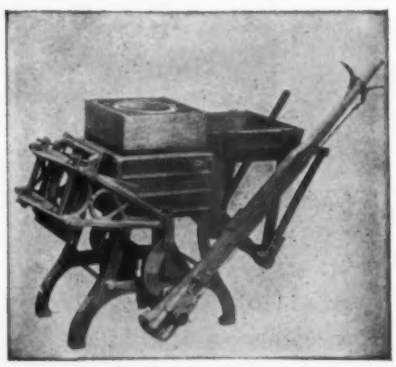
MULTIPLEX offers a wide variety of super-efficient mixing equipment, with all types of accessories necessary for economical mass production.

We can recommend MULTIPLEX units for modernizing *your* plant and enlarging its capacity.

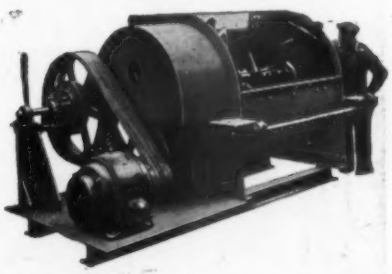
Our universal type MULTIPLEX Standard Tamper for making plain and stripper, or face blocks, on one base. Easily convertible as business expands. Supplied with 4-bar or 8-bar tamper, either power or hand operated.

Write for Booklet describing the MULTIPLEX complete line of concrete mixing equipment, including Double and Single Hand Press Strippers, Power Press Strippers, and Super-Tampers.

MULTIPLEX
CONCRETE MACHINERY CO.
Frank Muenzer, President
ELMORE • OHIO

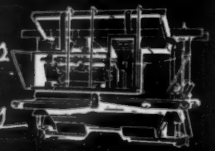
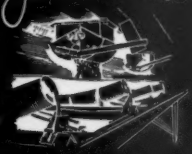


The MULTIPLEX Flue Block Machine makes ventilated, solid or lightweight units, including all attachments for ventilator and stove pipe openings.



MULTIPLEX Multi-Mixer with reverse screw-type action insures fast and thorough mixing of every batch. Side, end or bottom discharge.

WHAT'S ON Your SLATE for the IMMEDIATE FUTURE or the POST-WAR YEARS?

How about Ready Mixed Concrete Plants—engineered for even greater capacities? Or Central Mixing Plants . . that are pretty nearly "push-button" in control? Or Batching Plants? . . Or Bulk Cement Plants? Or high production Sand and Gravel . . . Plants? Or cleverly engineered . . . Concrete Products Plants? Or do you need Storage Bins or . . . . Coal Bins? . . . . . . Or are you looking for modern materials handling equipment such as the ingenious and startling Butler Carscoop that darts in and out of box-cars and corners at a phenomenal saving in time and labor? . . Or large capacity Cement Transports . . . Or Portable Concrete Hoppers to facilitate handling on the job? or Weigh Batchers  Or Bin Gates . .  ? . Whatever it is Butler has it—and if you'll write for Bulletin 260—you'll have complete information!

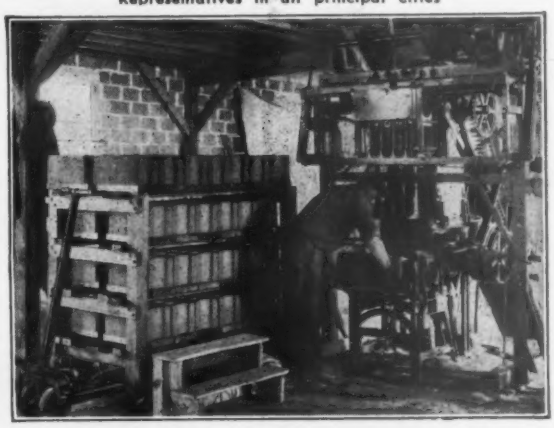
BUTLER BIN CO. WAUKESHA, WIS.

BARRETT LIFT-TRUCKS

ONE MAN HANDLES 48 BLOCKS NO BREAKAGE

Handle your green concrete products the way that more than 800 other concrete products plants do, WITH BARRETT LIFT-TRUCKS EQUIPPED WITH A SUPER-SPRING FRAME AND RUBBER TIRES. Eliminate breakage — joggling out of shape and spoilage. Save time, money and labor by eliminating all unnecessary handling and breakage. Take your blocks direct from the machine to the curing room—with ease and dispatch. One man handles 48 blocks of the 8x8x16 size—or, 32 blocks of the 8x12x16 size.
Write for illustrated circular.

BARRETT-CRAVENS COMPANY
3251 West 30th Street CHICAGO, ILL.
Representatives in all principal cities



FASTEST POURING

Almost Any Job of Concrete Can be Done Faster with JAEGER TRUCK MIXERS

"HIGH DUMP"

Millions of yards of Jaeger Truck-Mixed Concrete on major war work (exceeding the output of all other makes combined) prove the advantages of these motorized concrete plants. Nimble, flexible and fast, they speed placement, solve problem of extended or continuous pours.

THE JAEGER MACHINE CO.,
602 Dublin Avenue
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Mixers—Pumps—Hoists
Paving Equipment

or "LOW CHARGE" Type

WHEN THE POST-WAR BOOM BREAKS

Will you be able to supply the demand for sand and gravel—in great quantities and promptly? If there is any doubt about it, install Neff & Fry bins and elevator equipment so you can meet that increased demand. At least get your order on file for earliest possible installation.

Super-stave type.

Can be dismantled and re-erected should you have to shift your scene of operations. Get 1944 catalog.

THE NEFF & FRY COMPANY
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N & F
NEFF & FRY
BINS

GRUENDLER CRAFTSMANSHIP

Serving Industry over 50 Years

Crushing at Peak Production

150 to 200 tons of crushed rock per hour

Steam Shovel sizes to 5" to 6" minus in one-operation

These heavy plate and cast steel constructed roller bearing JAW CRUSHERS have tremendous crushing power. Built to take it for continuous operation with minimum maintenance. Built in many sizes for your requirements.

The Weight of above 25 x 42 JAW CRUSHER is 54,200 lbs.

Mfgrs. of Double Roll Crushers and Hammer Crushers for Secondary Crushing requirements.

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CRUSHER and PULVERIZER CO.

2915-17 North Market St., ST. LOUIS (6), MO.

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NEARLY NEW CONCRETE BATCHING PLANT

Capacity 250-350 Cu. Yd. Per Hour . . . Available for Immediate Delivery.

Complete Butler concrete plant. Excellent condition, used only 7 months. Adaptable for either commercial or construction use where high rate of concrete pour may be required. Equipped for manual, semi-automatic or automatic operational control. See details below.

BATCHING BIN. Bin—250 yd. capacity—190 yd. 3-compartment aggregate 400 bbl. cement.

2 BUTLER CEMENT STORAGE BINS. 2,000 bbl. capacity, 2-compartment, 3,000 bbl. capacity, single compartment. All bins equipped with air jets and steam jets.

BATCHERS. 1 Butler aggregate 5 yd. capacity, complete with beam-type scale, manual operation.

1 Butler cement 3,000 lb. capacity, complete with beam-type scale, manual or automatic operation.

1 Butler water batcher 200 gals. capacity, beam-type scale, complete with 400 gal. surge tank and valves, manual or automatic operation.

ELEVATOR & TRACK SCREW. 300 bbl. per hour capacity, screw 37 ft. long, equipped for either box car or hopper car cement delivery. Complete with 20 hp. electric motor.

CONVEYORS. 1 Barber Greene 36" inclined conveyor 224' 6" long, equipped with: 50 hp. Century motor; one 40 yd. track hopper; one 20 yd. track hopper; one 20 yd. truck hopper. All necessary A frames, trusses and supports included. All hoppers equipped with discharge gates.

1 Barber Greene 36" horizontal conveyor 129' 6" long. Complete with 18 double clam-type fill valves, 20 hp. Century electric motor complete with trusses.

1 Barber Greene 36" inclined conveyor 60' 6" long. Complete with 15 hp. electric motor, trusses and supporters.

All conveyors in excellent condition; two-way Alemite system of lubrication; band-type brake; pivoted distributor, ground level controlled. Conveyors operated under cover while in use. Idler take-up and return idler rollers in good shape. Extra length new 500 ft. belt available.

MISCELLANEOUS. Collecting hopper under batcher, 5 feet cement screw feeder complete with motor for automatic control of cement. Traveling hopper for charging batch trucks. Extra cement buckets, drive chain, elevator chain for cement elevator and track screw, etc.

Also 28 Late Model Transit Mixers

11—1942 Model Jaegers—High discharge, separate engine drive with two-speed transmission. 7 mounted on 1942 Dodge, six wheelers, good rubber, excellent condition.

7—1942 Model Smiths—High discharge type. These mixers were used only 6 months.

Also 6—1938 Model Smiths—High discharge type. 3 mounted on 1938 Autocars, 2 on Macks and 1 on White truck. All single axle drive in good condition, with good rubber.

MOTOR TRUCK SALES AND EQUIPMENT COMPANY

Telephone: CALUMET 1255

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The KEYSTONE of Modern CONCRETE Distribution Service

CONSERCO

Ready Mixed Concrete Truck Rental Service

. . . provides a highly efficient system of truck rental service that enables concrete producers to reach profitable markets over a wide range of territory . . . and without additional capital investment.

CONSERCO furnishes the required number of trucks to handle any hauling job . . . and all other necessary operating and maintenance facilities as well, including 4, 4½ or 5 yd. truck and mixer, truck and mixer upkeep, experienced driver, truck delivered to the job, gasoline, insurance, and oil.

DELIVER ANYTIME, ANYWHERE

Write for full details of the CONSERCO Plan, including rates.

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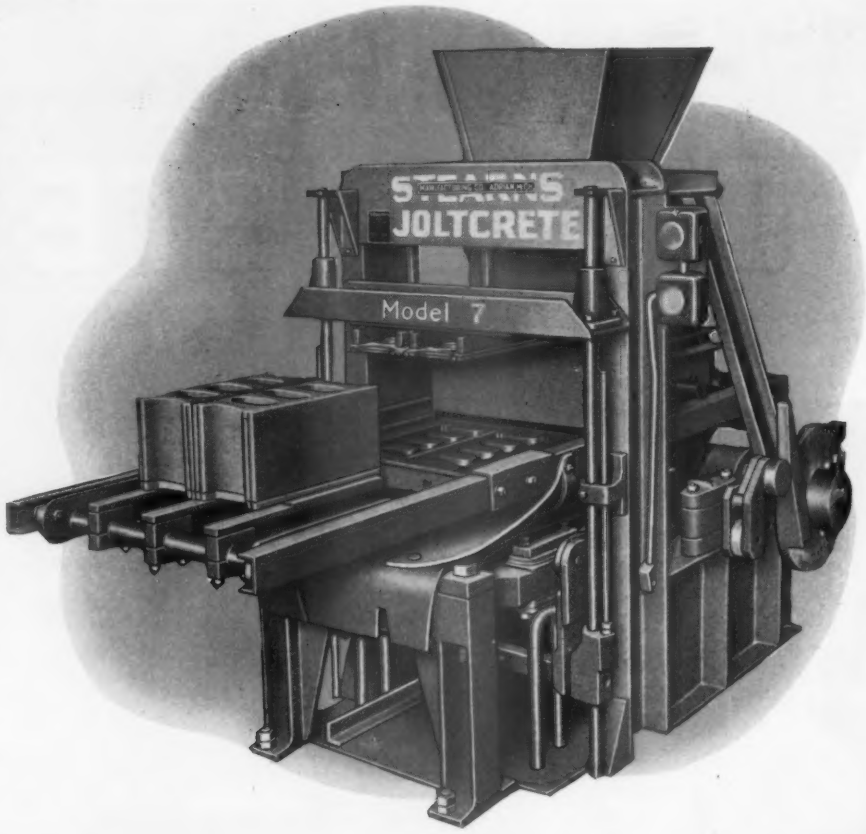
The CONCRETE MANUFACTURER



JOLTCRETE Model No. 7

Makes 360 8x8x16-inch Blocks per hour

● ***Intensity of Vibration*** is the same as our Joltcrete No. 9 — 7200 packing blows per minute. It has the same automatic operation, makes blocks of the same high quality.

● ***Low headroom:*** No. 7 stands just 5′1½″ high. Its width, including motor, is 6′3″, its depth 6′4″.

● ***Size of Mold Box*** is 16″ wide, 9″ high, 18″ long providing for a wide variety of shapes and sizes.

● ***Uses cored pallets.***

● ***Stearns Joltcrete No. 7 is an ideal machine*** for any plant faced with a demand for superior Joltcrete blocks but not requiring the larger output of our No. 9. It is especially economical in production and maintenance costs.

Write today for new Joltcrete folder illustrating and describing both models

Performance
Speaks Louder than Words

COMAC BUILDERS SUPPLY CO.
Rochester, N. Y.
One No. 7 Joltcrete

SPENCER CEMENT BLOCK CO.
Spencer, Iowa
One No. 7 Joltcrete

SKULI AUGUSTSON
Reykjavik, Iceland
One No. 7 Joltcrete

ASK any STEARNS owner.

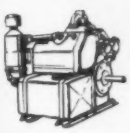
STEARNS
MANUFACTURING CO. - ADRIAN, MICH.
GENE OLSEN, PRESIDENT

Designers and manufacturers of vibration and tamp type block and brick machines . . . Mixers . . . Skip Loaders. Licensed under the basic Gelbman Vibration Patents.

SUPER-FINISHED **CRANKSHAFTS**

another **"PLUS FEATURE"**

IN ALL **WISCONSIN** *Air-Cooled* **ENGINES**



The very ingenious, specially designed machine illustrated above, puts a mirror-smooth *superfinish* on the crank-pins of all Wisconsin Air-Cooled Engines. By combining perfectly synchronized rotating and oscillating polishing movements, absolutely uniform diameter is maintained over the full length of the crankshaft bearing surfaces.

This is just another of the many small, but *important production details* that account for Wisconsin heavy-duty serviceability and smooth, efficient operation. Just another reason, too, why *your equipment* should be powered by a Wisconsin Engine.

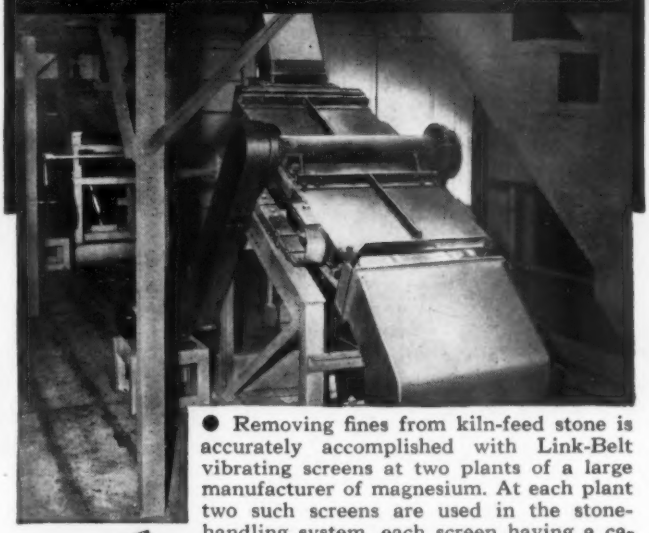
Most H.P. per pound

WISCONSIN MOTOR Corporation

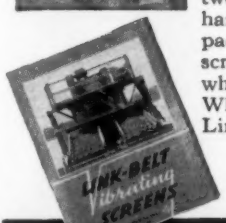
MILWAUKEE 14, WISCONSIN, U. S. A.

World's Largest Builders of Heavy-Duty Air-Cooled Engines

LINK-BELT *Vibrating Screens Aid in the Production of Magnesium*



● Removing fines from kiln-feed stone is accurately accomplished with Link-Belt vibrating screens at two plants of a large manufacturer of magnesium. At each plant two such screens are used in the stone-handling system, each screen having a capacity of 17½ tons per hour. Link-Belt screens are serving many varied industries, where screening operations are essential. When you need a vibrating screen—specify Link-Belt. Send for Catalog No. 1762.



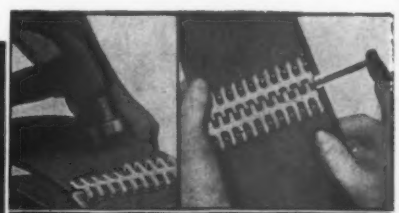
LINK-BELT COMPANY 9588

2045 W. Hunting Park Ave., Philadelphia 40.

Offices and distributors in all principal cities

WRITE TODAY! ***LINK-BELT*** *Vibrating Screens*

BELT LACING and FASTENERS for transmission and conveyor belts



"JUST A HAMMER TO APPLY IT"

ALLIGATOR

Trade Mark Reg. U. S. Pat. Office

STEEL BELT LACING

World famed in general service for strength and long life. A flexible steel-hinged joint, smooth on both sides. 12 sizes. Made in steel, "Monel Metal" and non-magnetic alloys. Long lengths supplied if needed. Bulletin A-60 gives complete details.

FLEXCO HD

BELT FASTENERS AND RIP PLATES

For conveyor and elevator belts of all thicknesses, makes a tight butt joint of great strength and durability. Compresses belt ends between toothed cupped plates. Templates and FLEXCO Clips speed application. 6 sizes. Made in steel, "Monel Metal", non-magnetic and abrasion resisting alloys.

By using Flexco HD Rip Plates, damaged conveyor belting can be returned to satisfactory service. The extra length gives a long grip on edges of rip or patch. Flexco Tools and Rip Plate Tool are used. For complete information ask for Bulletin F-100.

Sold by supply houses everywhere

"CONVEYOR BELTS EASILY FASTENED"

FLEXIBLE STEEL LACING CO.

4623 Lexington Street
Chicago, Ill.

The Problems of PEACE Lie JUST AHEAD

That's why we suggest an early acquaintance with Better-Built Davenports. If rails are a part of your production picture, you'll want top efficiency and unfailing performance from your haulage power units.

Davenport Locomotives are modern. Their inbuilt stamina, their smooth, ample power and easy controls will insure the standard of operation you require for work and more work—all done at a substantial saving.

Submit your requirements for reliable recommendations.

Entrust Your Post-War Haulage to Modern Davenports

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STEAM—GASOLINE—DIESEL LOCOMOTIVES—ELECTRIC OR MECHANICAL DRIVE

STEAM—GASOLINE—DIESEL LOCOMOTIVES—ELECTRIC OR MECHANICAL DRIVE

DAVENPORT LOCOMOTIVE WORKS

A DIVISION OF DAVENPORT BESLER CORPORATION, DAVENPORT, IOWA

Consult COLUMBUS

for reliable

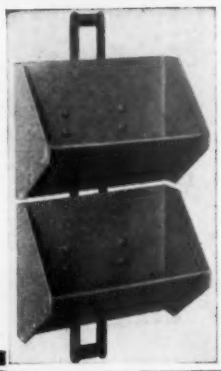
CONVEYING
ELEVATING
SCREENING
CRUSHING
TRANSMISSION

Machinery

For a Complete Plant or a Bucket

WE HAVE just the equipment you need for increasing the operating efficiency of your concrete, cement, or sand and gravel plants.

Upper photo shows a COLUMBUS-equipped sand washing plant, outfitted for economy "from feeder to truck" by COLUMBUS Engineers.



Write for Catalog 55

THE COLUMBUS CONVEYOR COMPANY

Columbus 8, Ohio

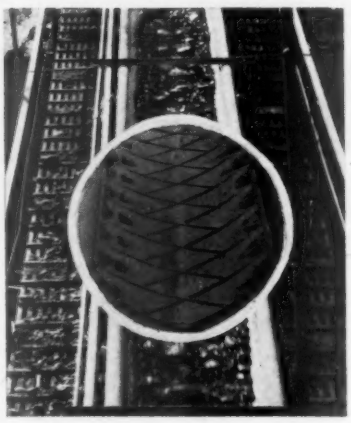
Some territory open for responsible representatives

AMERICAN

LIGHTNING

ribbed centre

CONVEYOR BELT



The patented pattern of this belt, enables it to carry even wet loads up improbably steep grades without slipping. It is possibly the best belt in the world for conditions where slipping is bad.

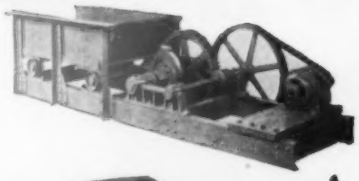
The AMERICAN RUBBER Mfg. Co.

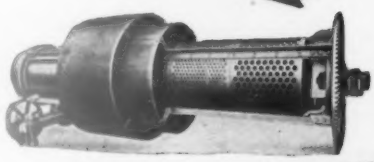
PARK AVENUE AND WATTS ST. — OAKLAND 8, CALIFORNIA

RUBBER PRODUCTS *for* INDUSTRY

McLANAHAN EQUIPMENT *for*

- **STONE**
- **SAND**
- **GRAVEL**





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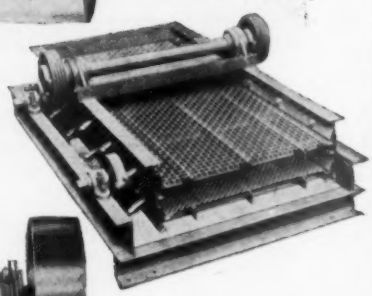

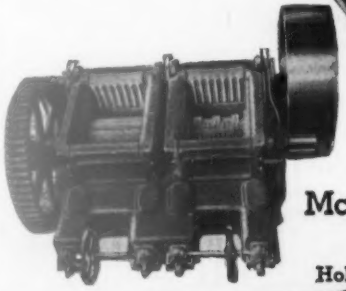

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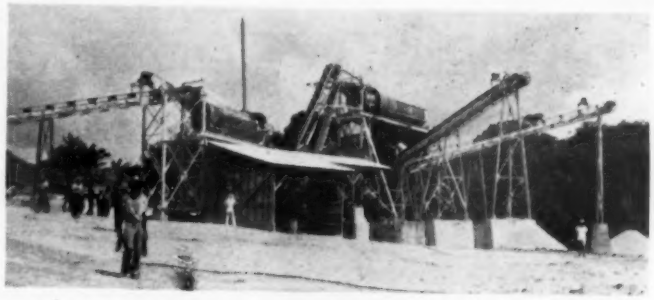

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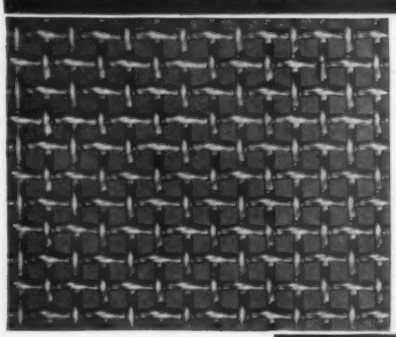

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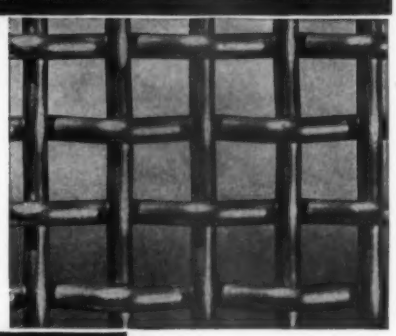

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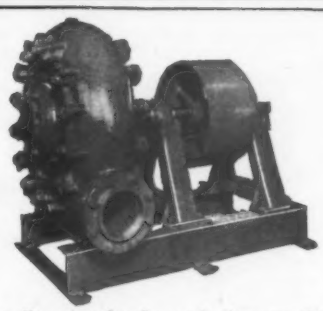

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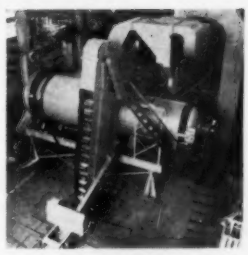

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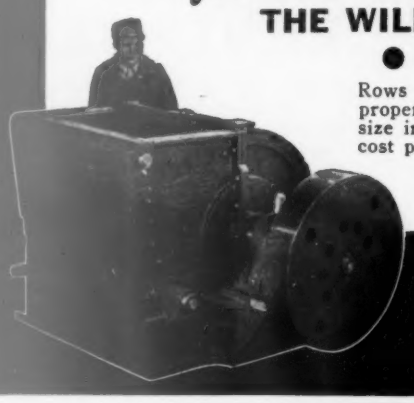

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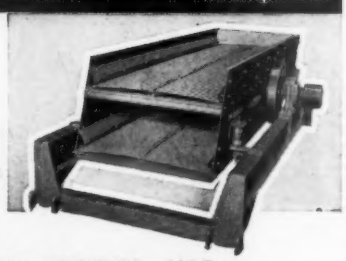

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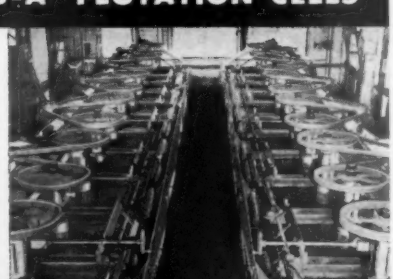

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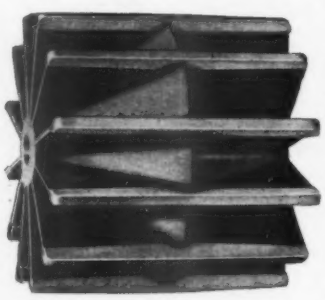

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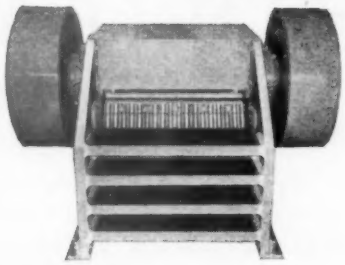

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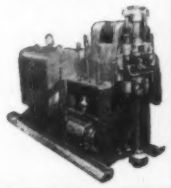

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42"	5	1/8"	1/16"	20"	4	1/8"	1/32"
36"	6	1/8"	1/16"	18"	4	1/8"	1/32"
30"	6	1/8"	1/16"	16"	4	1/8"	1/32"
30"	5	1/8"	1/16"	14"	4	1/16"	1/32"
24"	5	1/8"	1/32"	12"	4	1/16"	1/32"
24"	4	1/8"	1/32"				

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14"	6	8"	6	4"	5
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3—8'6 x 7'6 x 125'
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ROTARY DRYERS

5—5'6 x 5' x 60'
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8—42" Fuller Lehigh
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2—4" and 1—8", also valves

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1—20 Ton GE Std. Gauge Elec.
1—8 Ton Vulcan Std. Gauge Gas

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6—Jones Herringbone 93.5 to 1-50 H.P.

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Belt—all sizes
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All sizes from 230 cu. ft. to 3500 cu. ft.

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35 Ton WLG Plymouth Gas Locomotive.
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Sauerman ½ to ¾ yard bucket, with Mundy Hoist mounted on small International Truck, a portable job in good condition, good tires. Complete for $450.00.

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FOR SALE, 1¼", 1⅛", 1" and ⅞" PLOW and IMPROVED PLOW Steel wire rope, 6 x 7 and 19 construction, HEMP and WIRE centers; NEW and slightly used; EXCELLENT; for DRAG LINES, Dredging, Haulage, Inclines, Hoisting, etc. LOW PRICES; 10 upright Steel Bins with bottom CONES and HOPPERS; above located in EAST and MIDDLE WEST; WANT TO BUY; SCRAP and good used Rubber Conveyor Belts, any width and length. Box 940, c/o Pit and Quarry, 538 So. Clark St., Chicago 5.

One—30 ft. and one—25 ft. belt and bucket with 20 inch belt. Total enclosed and elevators used but a short time.
One 45 ft. with 18 buckets, open, elevator steel.
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One 36 by 10 rotary screen 1&½ inch mesh.
Two—Augers 12 inch. One 10 ft. other 6 ft.

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LOCOMOTIVE CRANES

(8-wheel)
15 ton Brownhoist, 50' boom
20 ton Industrial, 50' boom
25 ton Browning, 50' boom
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Gruendler 2XB Swing Hammer Pulverizer with 3 sets of Limestone hammers and extra grate bars. In running condition.

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Also
1—Erie Type B Steam Shovel, $2500.00.
1—Double drum, all electric THOMAS HOIST.
1—SAUERMAN dragline bucket, capacity 1 yard.
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No. 9 Allis-Chalmers Style K Crusher in good shape.
3 yard friction hoist, complete with electric motor and V-belt drive.

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20" x 24" Diamond Roll Crusher, with side delivery conveyor, steel hopper, mounted rubber tires. $1500.00.
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½ yd. Northwest Crane
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With or without Backhoe

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Give full information and price.

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Motors and Generators, A.C. and D.C. for sale at attractive prices. New and Rebuilt. All fully Guaranteed. Send us your inquiries.

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In applying give education, positions held with length of service, marital status, citizenship and age.

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1—20 ton Vulcan, standard gauge. Gasoline. Rebuilt.

1—50 ton American 0-4-0 Standard gauge, saddle tank. Rebuilt.

1—78 ton Baldwin 0-6-0, standard gauge, side tank. Rebuilt.

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1—Link-Belt Herringbone speed reducer #D-12, right hand, assembly having a ratio of 50.4:1, Style #1 overhung application, Serial #H-32311. This reducer is mounted on a welded steel base plate arranged for assembly to a 870 RPM motor and rated at 37.3 HP.

1—#RC-8018 roller chain flexible coupling to couple your motor and above reducer. This is an absolutely new unit and has never been in operation. Price at cost.

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Pulverizer air-swept mill complete with fan, cyclone collector, and piping. (Fuller Lehigh Mill.) No elevator or conveyor needed. Bargain for anyone wanting to do fine grinding.

4 Deck 4′ x 8′ Vibrating Screen
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50 Skips and Battleship Type, 2 to 6 Yds.
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5 Ton BROWNHOIST, 30 Ft. Boom Gas.
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25 Ton LINK BELT K-42 Electric, 70 Ft. Boom.
2 Yd. Monighan Electric 60 ft. Boom Dragline.
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14 ft., 8 ft. and 12 ft. Separators

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36x60 Fairmont Single Roll.
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24x24 & 36x16 & 36x20 Diamond Double Roll.

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10x8, 13x7½, 14x7, 15x9, 15x10, 16x9, 16x12, 16x10, 18x11, 20x8, 20x6, 20x10, 20x12, 20x11, 26x12, 30x15, 30x13, 36x30, 36x18, 36x14, 36x15, 36x9, 36x6, 38x18, 36x10, 36x24, 42x9, 48x36, 60x42, 84x66, 36x16, 9x36.
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15 in., 24 in., 30 in., 36 in. and 48 in. Symons Disc.
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5 Roll High Side.

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36 In. x 20 Ft., 3 Ft. x 30 Ft., 4 Ft. x 30 Ft., 54 In. x 130 Ft., 42 In. x 24 Ft., 5 Ft. x 30 Ft., 5 Ft. x 16 Ft., 5 Ft. x 60 Ft., 6 Ft. x 60 Ft., 6 Ft. x 70 Ft., 70 In. x 40 Ft., 8x30 & 8x84 Double Shell Dryers, 8x110, 7½x100, 8x125 & 10x20 Kilns.

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50000 gal. on 100 ft. tower.
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125 Ton 56′ x 10′6″ Platform 4 Section.

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1—65 ton American 0-6-0 standard gauge separate tender switcher, 20x26″ cylinders, ASME boiler, ICC papers.
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The above locomotives are now being rebuilt for prompt delivery.

1—40 ft. steel underframe flat car, 50 ton.
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Buchanan Crusher, 12″ x 36″ Type B Jaw Crusher.

Allis-Chalmers Double Roll Crusher, Garfield Type, Size 54″ x 20″, with new Manganese Roll Shells.

Lippman Scrubber Screen, 72″ x 18′, Complete with G.E. 20 HP Motor, 440 volt, with starter.

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Tail Swing only 21'-9". Excellent for barge mounting.

Ideal for coal-sand-stone-ore-ashes or lifting.

Condition like new.

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3—Allis-Chalmers Crushing Rolls, 36" x 15", 28" x 15"
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2—2' Symons Cone Reduction Crushers.
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5—30 to 100 Ton Steel Guy Derricks.
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2—4 ton floor controlled 220/3/60—46' span cranes.

National Equipment Company
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Need any used items?
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FOR SALE — CRUSHERS

1—15x36 Pioneer—Roller Bearing
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1— 9x36 Plain Bearing
1 Set—40x20 Pioneer Rolls, roller bearing

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FOR THE DURATION OR POST-WAR—SAVE DEMURRAGE, SWITCHING, EXTRA HANDLING COSTS, DAMAGING FOREIGN CARS, ETC.

Which of these cars could YOU use?

80, Hopper, Double, 50-Ton
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100, Refrigerator, 40-Ft., 40-Ton
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All cars are priced to sell!

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2—3 x 6 three deck Simplicity screens
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All items are f.o.b. Omaha, Nebraska—except item Number 5.

All equipment is quoted subject to prior sale.

Terms: Net Cash.

Item	Quantity	Description
		BUCKETS—ORANGE PEEL
1.	1	9 cu. ft. Hayward—overhauled.
2.	1	¾ cu. yd. Hayward—overhauled.
		BUCKETS—DRAGLINE
3.	2	2 cu. yd. Page with teeth—overhauled.
4.	1	1¼ cu. yd. Omaha with teeth—overhauled.
		BITUMINOUS EQUIPMENT
5.	1	BARBER-GREENE Model 62-A heavy duty travel plant, consisting of 1 Model 62-A loader, capacity 2 cu. yds. per minute, mounted on crawlers, and powered with Buda Model YTU gasoline engine, and 1—Model 68A Mixer, capacity 2 cu. yds. per minute, mounted on crawlers and complete and ready to run. This plant has been thoroughly overhauled and is ready to run. Price f.o.b. cars Dorchester, Nebraska.
		CRANES—DRAGLINES
6.	1	P & H Crane dragline, Model 600, serial #3613, 55′ boom, powered with Waukesha gas engine, Model 5X-5 Serial #216303. Thoroughly overhauled.
7.	1	P & H ⅜ cu. yd. truck crane with 30′ boom powered with gas engine, mounted on 5 ton Mack truck with tandem wheels in rear. In good condition.
		COMPRESSORS
8.	1	Schramm 240 cu. ft. displacement on 4 steel wheels, Serial #25248, overhauled. In good working condition, and painted.
9.	1	Schramm 240 cu. ft. displacement on 4 steel wheels Serial #160086, overhauled and in fine condition and painted.
		DITCHERS
10.	1	BARBER-GREENE Model 44-C Serial #44-9-46, overhauled and painted. In best condition. Digs 12″ wide and 5′6″ deep.
		FORM TAMPERS
11.	1	CLEVELAND No. 030x42 — new — no priority.
		MIXERS AND PAVERS
12.	1	KOEHRING Model 34-E Twin Batch Paver, Serial #17531, new cost $18,500. Overhauled and in first-class condition.
		PUMPS
13.	1	GORMAN RUPP Road Pump, Model R100 Serial #2503, powered with Hercules gas engine Model JXC No. 559338, on four steel wheels. Delivers 100 GPM 600# pressure. In A-1 condition. New Price $1990.00 factory.
14.	1	6″ Well Point System, complete, overhauled, ready to go. Consists of 2 pumps (1 — COMPLETE, 1 — MORE-TRENCH), 125 good points, 200—1½″ 4, 6, 10 and 12 ft. riser pipe, 2—2″ Gate valves, full set end stops, corners, swings, unions, couplings, elbows, and 50 extra point screens. New impeller and shell for one pump and extra access. Some never used.
		MISCELLANEOUS
15.	1	5KW LE ROI Light Plant—A-1 condition.
16.	1	1″ U. S. Electric Drill Model FA1. In good working condition.
17.	1	OSTER Pipe and Bolt threading machine. Capacity up to 3″ with accessories in A-1 condition.
18.	1	ROSCO Model MAD water applicator on pneumatic tires, nearly new.
		SCALES
19.	1	FAIRBANKS-MORSE Platform scale, Model 1569, 31 x 31 platform, 1500 to 2000 lbs. capacity; on wheels, in working condition—as is where is.
20.	2	FAIRBANKS-MORSE 3 beam 800# capacity wheelbarrow scales with over and under indicator—Model 11953. Slightly used and in excellent condition.
21.	2	JOHNSON 3 beam 800# capacity—same as above (item 20).
		SAWS
22.	1	PORTER-CABLE 10″ Speedmatic saw complete with stand. Factory rebuilt.
		VIBRATORS
23.	2	Used VIBER electric Model 150, 12′ shaft—overhauled.
24.	1	Used VIBER electric Model 12, 12′ shaft—overhauled.
25.	1	Slightly used VIBER electric Model 120, 12′ shaft—overhauled.
26.	1	Used VIBER electric, Model 120, 12′ shaft—overhauled.
27.	1	Used MALL gas vibrator, 21′ shaft—overhauled.

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#68 Kennedy Reduction Crusher with 75 HP synchronous motor built in flywheel, in very good condition.
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